99th Congress, 2d Session - - - - - - - - - - House Document 99-162

THREEMILE CREEK, MOBILE, ALABAMA

COMMUNICATION

FROM

THE ASSISTANT SECRETARY OF THE ARMY (CIVIL WORKS)

TRANSMITTING

A CORPS OF ENGINEERS REPORT ON THREEMILE CREEK, MOBILE, ALABAMA, IN PARTIAL RESPONSE TO RESOLUTIONS ADOPTED OCTOBER 12, 1972 AND APRIL 11, 1974, BY THE HOUSE PUBLIC WORKS AND TRANSPORTATION COMMITTEE

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FEBRUARY 5, 1986.—Referred to the Committee on Public Works and Transportation and ordered to be printed

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LETTER OF TRANSMITTAL

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103

23 JAN 1986

Honorable Thomas P. O'Neill, Jr.
Speaker of the House of Representatives
Washington, D. C. 20515

Dear Mr. Speaker:

I am transmitting herewith a report dated April 20, 1984, and accompanying supplement report dated September 23, 1985, from the Chief of Engineers, Department of the Army, on Threemile Creek, Mobile, Alabama, together with other pertinent reports. These reports are in partial response to resolutions adopted October 12, 1972, and April 11, 1974, by the House Public Works and Transportation Committee.

The views of the State of Alabama, the Departments of the Interior, Agriculture, Transportation, Housing and Urban Development, and the Environmental Protection Agency, are set forth in the enclosed communications. Comments on this report have not been received from the Federal Emergency Management Agency.

The plan concurred in by the Chief of Engineers consists primarily of channel improvements and other measures to reduce flood damages along 5.6 miles of Threemile Creek. It also includes construction of a baseball field on about three acres of separable lands to be acquired by non-Federal interests.

It has been longstanding Army policy to formulate this type of local protection project for flood control, then to add recreation facilities which are compatible with the basic flood control project. Under this policy, Federal cost sharing is limited to recreation facilities located on land acquired for the flood control project and to minimal additional land required for access, parking, potable water, sanitation and related developments for health and safety. The acquisition and development of land for a baseball field is not consistent with this policy.

I concur with the recommended plan in the report of the Chief of Engineers, subject to enactment of generic cost sharing legislation and to deletion of separable recreation lands and recreation development not consistent with the policy noted above.

The Office of Management and Budget concurs in the above with cost sharing consistent with Adminstration policy and advises that there is no objection to the submission of this report to the Congress. A copy of its letter is enclosed.

Sincerely,

Robert K. Dawson
Assistant Secretary of the Army
(Civil Works)

Enclosure

COMMENTS OF THE OFFICE OF MANAGEMENT AND BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

December 13, 1985

Honorable Robert K. Dawson
Assistant Secretary of the Army
for Civil Works
Room 2E570 - Pentagon
Washington, D.C. 20310

Dear Mr. Dawson:

On October 29, 1985, you sent this office a copy of the report of the Chief of Engineers on Threemile Creek, Alabama, with your recommendations and draft transmittal letter to Congress. We have completed our review of this project as required under Executive Order 12322.

The Office of Management and Budget does not object to your submitting this report to Congress. The Administration supports authorization of the project for construction in accordance with your recommendations, contingent upon passage of cost-sharing legislation consistent with Administration policy.

Sincerely,

Randall E. Davis
Associate Director
for Natural Resources,
Energy and Science

COMMENTS OF THE STATE OF ALABAMA

Alabama Department Of Economic And Community Affairs

GEORGE C. WALLACE
GOVERNOR

W.M. "BILL" RUSHTON
DIRECTOR

January 31, 1984

Lieutenant General J. K. Bratten
Chief of Engineers
Attention: DAEN-CWP
Department of the Army
Washington, DC 20314

Dear General Bratten:

This is to advise that the "Interim Survey Report and Environmental Impact Statement, Three Mile Creek, Mobile, Alabama" has been reviewed by the Alabama Department of Economic and Community Affairs.

During the review, it was noted that the citizens residing in the vicinity of Three Mile Creek support the proposed project as well as the City Commission. In fact, it was determined the City Commission has begun work on the project in advance of project approval.

The Alabama Department of Economic and Community Affairs concurs with the report and its concepts. During the review it was noted that six (6) federal agencies have reviewed the report and this Department recommends that the Corps consider their comments. During this review period, the Alabama Department of Conservation and Natural Resources was given an additional opportunity to review the report but declined to comment.

Concurrence with this report should in no way be considered an obligation by the State of Alabama to participate in the funding of any project subsequently approved.

Sincerely,

W. M. "Bill" Rushton
Director

COMMENTS OF THE DEPARTMENT OF THE INTERIOR

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER 83/1193

December 13, 1985

Lieutenant General J. K. Bratton
Chief of Engineers
ATTN: DAEN-CWP
Department of the Army
Washington, D.C. 20314

Dear General Bratton:

Thank you for the letter of September 22, 1983, requesting our views and comments on the proposed report of the Chief of Engineers and the final environmental statement for Threemile Creek, Mobile County, Alabama.

We note that the final plan deviates substantially from the plan recommended in the draft reports. Consequently, the evacuation plan which would have provided 13 acres of revegetated floodplain was omitted during the interim because of economics. This is unfortunate since, in the initial planning stages, this floodplain restoration was viewed as a major mitigation feature for loss of riparian vegetation and especially for the 5 acres of contiguous forested wetlands near the terminus of the project. This was emphasized in the Fish and Wildlife Service's (FWS) October 21, 1982, Fish and Wildlife Coordination Act Report. Not only would this evacuation in association with the Federal project have helped to mitigate the loss of riparian vegetation, it could also have demonstrated the needs and benefits of sound floodplain management that is desperately needed along Threemile Creek.

It is our understanding that this area may still be evacuated by the Federal Emergency Management Agency (FEMA). So that the opportunity to mitigate project losses will not be foregone, we believe the Corps of Engineers should initiate coordination with FEMA and FWS to consider potential arrangements whereby the area could still be revegetated in the event that it is evacuated. We recommend that the Chief's proposed report be modified to identify such an intent for further coordination and mitigation planning.

Sincerely,

Bruce Blanchard, Director
Environmental Project Review

LETTER TO THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF

Planning Division

April 20, 1984

Mr. Bruce Blanchard
Director, Environmental Project Review
Office of the Secretary
Department of the Interior
Washington, D. C. 20240

Dear Mr. Blanchard:

This is in reply to your recent letter commenting on my proposed report on Threemile Creek, Mobile, Alabama.

As you noted, the evacuation component of the plan recommended in the draft report has been deleted. The current policy for evaluation of flood damage reduction alternatives requires that components of the plans provide economic justification. Although floodplain evacuation takes high priority in the Corps of Engineers' evaluation process, the nonstructural increment considered for Threemile Creek had a benefit to cost ratio well below unity and was deleted as part of the recommended plan. While this does represent a reduction in the total plan from the draft report, it is not considered a substantial deviation.

Throughout the planning process on Threemile Creek, the Corps has maintained close coordination with the Federal Emergency Management Agency, Housing and Urban Development, the city of Mobile, the U.S. Fish and Wildlife Service and other Federal and state agencies. We will continue to do so during the detailed design stages of the project and will take every practicable opportunity to minimize environmental damage and promote environmental improvement and protection of the environmental resources of the area.

Your letter, together with a copy of this reply, will be included with the report when it is submitted to the Congress.

Sincerely,

Richard M Wells, MG, USA
for J. K. Bratton
Lieutenant General, U. S. Army
Chief of Engineers

COMMENTS OF THE DEPARTMENT OF AGRICULTURE

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20250

December 6 1983

Lieutenant General Joseph K. Bratton
Chief of Engineers
Office of the Chief of Engineers
Army Corps of Engineers
U.S. Department of the Army
Washington, D.C. 20314

Dear General Bratton:

We appreciate the opportunity to review the reports on Threemile Creek, Mobile, Alabama. If the recommended plan is implemented, the channel modification will eliminate 95 percent of the flood damages and the recreation facilities will provide 34,000 visitor-days annually. The U.S. Army Corps of Engineers estimates the project to cost $17.73 million and the benefit-cost ratio to be 1.4:1.

We have no objection to the findings and recommendation. The report complies with applicable principles and guidelines. The recommended plan would not affect farmlands or water used for agriculture. It does not conflict with this Administration's policies, projects, or programs.

Sincerely,

Richard E. Lyng

Richard E. Lyng
Deputy Secretary

COMMENTS OF THE DEPARTMENT OF TRANSPORTATION

U.S. Department of Transportation
United States Coast Guard

Commandant
United States Coast Guard

Washington, DC 20593
Staff Symbol: G-MP/11
Phone: (202) 426-9584

03 0661L
13 December 1983

Lieutenant General J. K. Bratton
Chief of Engineers
Attn: DAEN-CWP
Department of the Army
Washington, D. C. 20314

Dear General Bratton:

The concerned operating administrations and staff of the Department of Transportation have reviewed the proposed report and Final Environmental Impact Statement on Threemile Creek, Mobile, Alabama.

The only comment we have is that the Corps of Engineers will need to apply to Commander, Eighth Coast Guard District (obr) for a permit for any modifications to the Station 30 + 30 I.C.S. Railroad Bridge.

The opportunity to review the reports and Final Environmental Impact Statement on Threemile Creek is appreciated.

Sincerely,

W. R. RIEDEL
Chief, Planning, Coordination
and Analysis Staff
By direction of the Commandant

COMMENTS OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

U.S. Department of Housing and Urban Development
Atlanta Regional Office, Region IV
Richard B Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

November 8, 1983

Lieutenant General J. K. Bratton
Chief of Engineers
Attention: DAEN-CWP
Department of the Army
Washington, DC 20314

Dear General Bratton:

We have completed our review of the report and Final EIS on the Threemile Creek, Mobile, Alabama. We concur with the Corps' recommended plan for flood control which calls for the enlargement of the existing channel and incorporation of recreational facilities in the floodplain.

HUD participated in the Interagency Flood Hazard Mitigation Team efforts during the flood in May, 1981, and, therefore, are very familiar with the problem and supportive of your efforts. Action to alleviate the problem will provide long range benefits to the community and its citizens.

Thank you for the opportunity to review the report and FEIS.

Sincerely,

Ivar O. Iverson
Regional Environmental Officer

COMMENTS OF THE ENVIRONMENTAL PROTECTION AGENCY

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

OCT 12 1983

4PM-EA/GM

Lieutenant General J.K. Bratton
Chief of Engineers
Department of The Army
Washington, D.C. 20314

Attention: DAEN-CWP

Dear General Bratton:

We have reviewed the Final Environmental Impact Statement on Threemile Creek (Mobile County, Alabama) and have no additional comments to make.

Sincerely yours,

Sheppard N. Moore

Sheppard N. Moore, Chief
Environmental Review Section
Environmental Assessment Branch

THREEMILE CREK, MOBILE, ALABAMA

REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314

REPLY TO ATTENTION OF:

DAEN-CWP-A

April 20, 1984

SUBJECT: Threemile Creek, Mobile, Alabama

THE SECRETARY OF THE ARMY

1. I submit for transmission to Congress my report on Threemile Creek, Mobile, Alabama, accompanied by the reports of the Board of Engineers for Rivers and Harbors and the District and Division Engineers. These reports are in partial response to resolutions adopted 12 October 1972 and 11 April 1974 by the House Public Works and Transportation Committee. The Committee requested that the Board review pertinent reports with particular reference to a comprehensive study for flood protection, wise use of floodplains, bank and channel stabilization, restoration and protection of natural lake and estuarine areas, and other purposes.

2. The District and Division Engineers recommend authorization of a flood control project which includes 5.6 miles of channel enlargement with four drop structures, removal of 42 houses and 2 businesses, replacement or modification of 7 bridges, and recreation facilities.

3. The Board of Engineers for Rivers and Harbors concurs in the views and recommendation of the reporting officers. It recommends the plan subject to cost-sharing and financing arrangements satisfactory to the President and the Congress.

4. Using October 1983 price levels, the project's first cost is $17,780,000. Average annual charges, based on a 8-1/8 percent interest rate and a 50-year period for economic analysis, are $1,471,000. Average annual benefits are $2,066,000 and the benefit-cost ratio is 1.4.

5. I note that the Congress, in enacting P.L. 98-63, the 1983 Supplemental Appropriations Act, specified that benefits and costs for work initiated on the project subsequent to 1 January 1982 be credited toward the project.

6. I concur in the findings, conclusions, and recommendations of the Board which is the plan to enlarge 5.6 miles of channel and to provide compatible recreation facilities. This plan includes the removal of 42 houses and 2 businesses from the construction right-of-way. This recommended plan maximizes net national economic development benefits.

7. The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels within the Executive Branch. Consequently, the recommendations may be modified before they are transmitted to the Congress as proposals for authorization and/or implementation funding.

FOR William Wells, MG, USA
J. K. BRATTON
Lieutenant General, USA
Chief of Engineers

THREEMILE CREK, MOBILE, ALABAMA

SUPPLEMENT REPORT OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY

DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF ENGINEERS
WASHINGTON, D.C. 20314-1000

REPLY TO ATTENTION OF:
DAEN-CWP-A

September 23, 1985

SUBJECT: Threemile Creek, Mobile, Alabama

THE SECRETARY OF THE ARMY

1. This supplements the Chief of Engineers report of April 20, 1984, on the same subject. This report provides additional information to show that the recommended plan maximizes net national economic benefits and is appropriately designated the National Economic Development (NED) plan.

2. A wide range of alternative solutions was considered during the planning of the project as described in paragraph 6 of the report of the Board of Engineers for Rivers and Harbors. A plan designated as the "Comprehensive Plan" evolved from these alternatives to meet the flood damage reduction objective by combining channel modification in the upper portions of the basin and flood plain evacuation in the lower portion. The evacuation portion, however, was not incrementally justified and was not included in the Federal plan. The local sponsor elected to implement that part of the plan and has removed nearly 200 structures from the flood plain.

3. The scope and scale of the channel modification plan were carefully evaluated to determine the NED plan. The recommended plan reduces average annual damages by 94 percent at an average annual cost of $1,278,000 with average annual benefits of $1,748,000 and net benefits of $470,000. A smaller channel modification plan reduces average annual damages by 91 percent at an average annual cost of $1,223,000 with average annual benefits of $1,685,000 and net benefits of $462,000, while a larger alternative reduces average annual damages by 94 percent at an average annual cost of $1,435,000 with average annual benefits of $1,754,000 and net benefits of $319,000. Although this comparison, conducted during plan formulation, utilizes figures at October 1981 price levels and a 7-5/8 percent interest rate, the plans' relative positions would remain the same at current prices and interest rate.

4. I conclude that the recommended plan is the best plan and it maximizes net national economic benefits.

E. R. HEIBERG III
Lieutenant General, USA
Chief of Engineers

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

DEPARTMENT OF THE ARMY
BOARD OF ENGINEERS FOR RIVERS AND HARBORS
KINGMAN BUILDING
FORT BELVOIR, VIRGINIA 22060

REPLY TO ATTENTION OF:

BERH-PLN

18 July 1983

SUBJECT: Threemile Creek, Mobile, Alabama

Chief of Engineers
Department of the Army
Washington, DC 20314

Summary of Board Action

The Board finds that the plan for flood control and recreation improvements on Threemile Creek is needed and is economically justified and environmentally acceptable. The Board concurs in the reporting officers' plan to enlarge 5.6 miles of channel and to provide compatible recreation facilities. The project's first cost is estimated at $17,726,000 (October 1982 price levels), and the benefit-cost ratio is 1.4. The Board recommends implementation of the proposed project subject to cost-sharing and financing arrangements satisfactory to the President and the Congress.

Summary of Report Under Review

1. Authority. This interim report is in partial response to House Public Works and Transportation Committee Resolutions adopted 12 October 1972 and 11 April 1974. The Committee requested a comprehensive study for flood protection, wise use of floodplains, bank and channel stabilization, restoration and protection of a natural lake and estuarine areas, and other purposes. The resolutions are quoted in the District Engineer's Report. A final report in full response to the study resolutions will be submitted later.

2. Description of the study area. Threemile Creek originates in the western part of Mobile, Alabama, and flows in an easterly direction for a distance of 14 miles where it enters the Mobile River. The creek has a total drainage area of 29 square miles and ranges in width from 10 feet in the headwaters to 80 feet in the lower reaches. The upper one-half of the Threemile Creek basin is moderately urbanized, but the lower 50 percent of the basin, including the floodplain, is highly urbanized. Land use is 71-percent residential; 4-percent industrial; and 25-percent other uses such as forest, open land, or marsh. The creek has a history of poor water quality due to urban storm runoff, treated and untreated point-source discharges, and untreated sewage inflow resulting from frequently broken sewerlines.

3. Existing improvement. There are no Federal flood control improvements on Threemile Creek. Local interests have accomplished clearing and snagging, debris removal, floodplain evacuation and channel excavation in order to reduce flood damages. Recreation development includes the 720-acre Langan Municipal Park, a proposed 300-acre municipal park, and nine small community parks. Langan Park has a small recreation lake with a fixed crest dam spillway. The lake's effect on downstream flooding is negligible.

4. Problems and needs. Threemile Creek has a history of flooding, with the most recent events occurring in April and May of 1980 and May 1981. The April 1980 flood damaged about 500 homes, numerous businesses, and caused extensive damage to roads, utilities, and other public facilities. Total damages were estimated to be about $17,000,000. The floodcrest of 17 May 1980 was 0.7-foot lower than the April 1980 crest. Damages sustained by the May 1981 flood were about $23,000,000 and included approximately 1,000 homes and 100 businesses. As a result of these floods and the damages caused by Hurricane Frederic in 1979, Mobile was declared a Federal disaster area for 3 consecutive years. Therefore, there is a need for flood damage reduction measures. There is also a need for recreation facilities associated with pedestrian and bicycle trails.

5. Improvements desired. Local interests desire protection against flooding as soon as possible.

6. Alternatives considered. Upstream retention, stream diversion, channel modification, and nonstructural measures were the four basic flood damage reduction solutions investigated by the reporting officers. These metnods were the basis for studying 14 different alternative plans.

7. Plan of improvement. The reporting officers' recommended plan includes 5.6 miles of channel enlargement with four drop structures, removal of 42 houses and 2 businesses, replacement or modification of 7 bridges, and recreation facilities.

8. Economic evaluation. Based on October 1982 price levels, the District Engineer estimates the total first cost of the project at $17,726,000, of which $8,870,000 would be non-Federal based on traditional cost-sharing policies. Annual charges, based on a 7-7/8 percent interest rate and a 50-year period for economic analysis, are estimated at $1,447,000. Average annual benefits are estimated at $2,053,000, and the benefit-cost ratio is 1.4.

9. Project impacts.

a. Economic. The recommended plan maximizes net national economic benefits. Residential structures and contents account for 56 percent of the total average annual flood damages reduced, followed by commercial properties with 32 percent. The plan would also provide 34,000 visitor-days of recreation.

b. Environmental. The proposed project would require 122 acres of land, of which 22 acres would be converted from residential and commercial use to vegetated land and 8 acres would be paved for recreation. About 5 acres of tidal, freshwater marsh would be lost and 43 acres of forest would be disturbed. During construction, noise and dust could be temporary problems.

c. Social. The social well-being of floodplain residents would be enhanced by a 95-percent reduction in average annual flood damages.

10. Recommendation of the reporting officers. The District Engineer recommends authorization for construction, generally in accordance with the plan described in his report and subject to certain items of local cooperation. The Division Engineer concurs.

Review by the Board of Engineers for Rivers and Harbors

11. General. In reviewing the report, the Board considered technical features, economic feasibility, environmental consequences, and social acceptability of the recommended plan. It also considered the report's conformance with essential elements of the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources, as well as the views of local interests and Federal and State agencies.

12. Response to the Division Engineer's public notice. The Division Engineer issued a public notice on 7 February 1983 stating the recommendations of the reporting officers and inviting public comment to the Board. One letter was received in response to the notice which objected to the plan because it would require the taking of a residence.

13. Findings and conclusions. The Board of Engineers for Rivers and Harbors concurs in the views and recommendations of the reporting officers. The report essentially complies with applicable policies and guidelines, and the items of local cooperation are appropriate. The recommended plan maximizes net National Economic Development benefits, and impacts on fish, wildlife, vegetation, and esthetics are expected to be small.

14. The Board notes that local interests have taken positive action to reduce the magnitude of flood problems along Threemile Creek and to make advance preparations for the recommended Federal project. Work underway at this time includes floodplain evacuation, right-of-way acquisition, channel excavation, and studies for bridge and utilities relocations. The non-Federal expenditure to date for this work is about $13,600,000. Of this amount, $2,500,000 is for work required as part of the recommended Federal project.

15. The Administration's position on flood control/local protection cost sharing and financing was presented by the Assistant Secretary of the Army (Civil Works) on 15 June 1983 before the Subcommittee on Water Resources of the Senate Committee on Environment and Public Works. For flood control the minimum non-Federal share of construction costs would be 35 percent; however, the traditional requirements specified by the 1936 Flood Control Act would be applicable where those requirements exceed the 35 percent minimum. Where raising capital during construction would place an undue burden on sponsors, then a portion of the non-Federal share could be financed, provided that the Federally financed portion is repaid in full with interest. Operation, maintenance, and replacement costs would be a non-Federal responsibility.

16. Recommendations. The Board recommends construction of flood control improvements on Threemile Creek, Mobile, Alabama, generally in accordance with the plan of the reporting officers, with such modifications as in the discretion of the Chief of Engineers may be advisable, and in accordance with cost-sharing and financing arrangements satisfactory to the President and the Congress. The estimated first cost to the United States for implementation is $8,856,000. This recommendation is made with the provision that, prior to implementation, non-Federal interests will, in addition to the general requirements of law for this type of project, agree to comply with the following requirements:

a. Provide without cost to the United States all lands, easements, and rights-of-way necessary for implementation and maintenance of the project, including suitable areas determined by the Chief of Engineers for initial and subsequent disposal of excavated material, and necessary retaining dikes, or the costs of such retaining works;

b. Accomplish without cost to the United States all alterations and relocations of buildings, transportation facilities, storm drains, utilities, and other structures and improvements necessary for the project;

c. Provide a cash contribution for recreation facilities equal to 50 percent of the final first cost for this function;

d. Maintain and operate the project after completion without cost to the United States in accordance with regulations prescribed by the Secretary of the Army; and

e. Hold and save the United States free from damages due to construction, operation, and maintenance of the project, except where such damages are due to the fault or negligence of the United States or its contractors.

17. The Board also recommends that the non-Federal first cost for flood control be limited to 50 percent of the total construction cost allocated to flood control, as provided for in the Flood Control Act of 1936 (49 Stat. 1570).

FOR THE BOARD:

WILLIAM E. READ
Major General, USA
Acting Chairman

REPORT OF THE DISTRICT ENGINEER

SYLLABUS

The Honorable Jack Edwards of the First Congressional District of Alabama, requested that the Corps of Engineers undertake a study of Threemile Creek in Mobile, Alabama, to determine if flood damage reduction measures could be justified. The creek has a history of severe damaging floods, with the most recent occurrence in April and May of 1980 and May 1981. These three floods occurred within a 13-month time frame and caused damages estimated at about $35,000,000. As a result of flooding, Presidential disaster declarations occurred in 1980 and 1981.

Mobile is located in a temperate climate with its weather being influenced by the Gulf of Mexico, which lies about 30 miles south of the Threemile Creek basin. The creek is one of several streams providing drainage for Mobile, Alabama. It originates in the western part of the city and flows easterly about 14 miles to enter the Mobile River near the Alabama State Docks. The drainage area of the basin at the mouth covers 29 square miles. Average elevation along the basin divide above Interstate 65 is 220 National Geodetic Vertical Data (NGVD) and about elevation 40 NGVD below Interstate 65. The basin is about 8 miles long and has an average width of 3.5 miles. In the upper 5.6 miles the creek has a fall of about 25.9 feet per mile and 9.2 feet per mile in the lower 8.7 miles. The creek bottom varies from 10 to 80 feet wide and has average bank height of 8 feet at Stanton Road.

Stream water quality in the extreme upper reach of the creek is fair, but within the study area it is very poor, due to urban runoff and periodic leakage of sewage lines. Poor water quality makes it unsuitable for fish propogation and wildlife habitat is confined to narrow, intermittently wooded borders along the streambanks. Wildlife within the drainage basin consists of species normally found in urban areas.

The flood plain along Threemile Creek is densely populated with houses and businesses. When flood producing storms are predicted for the Mobile area, inhabitants of the flood plain live in constant fear of devastating floods

reflecting on past events. The May 1980 flood inundated about 100 commercial and industrial structures and about 1,000 homes. Average annual damages in the study area are estimated to be about $1,853,000.

Considering four basic types of flood damage reduction techniques: upstream retention, stream diversion, channel modification, and flood plain evacuation, 14 different alternatives were evaluated. Some plans were found to lack economic feasibility and others met with local opposition. Through systematic formulation and evaluation of the alternatives, a flood control plan was selected which would best solve the problems and meet the needs of the occupants of the Threemile Creek flood plain. The plan would consist of enlarging the stream a total distance of 5.6 miles. The modified channel would vary in width from 148 feet at the lower end to 70 feet in the uppermost segment. The plan would require the removal of 42 houses and 2 businesses from the channel right-of-way. The channel modification would reduce the level of the improved 100-year frequency flood to the level of the existing 5-year frequency flood and eliminate about 95 percent of the average annual flood damages. A recreation facilities plan compatible with flood plain use are also included.

The total first cost for the plan is $17,055,200 of which $8,454,500 is Federal and $8,600,700 non-Federal. Upon completion of the Federal project, when final costs can be established, a determination of local and Federal costs will be made. In accordance with 1936 Flood Control Act, local interest will not be required to pay more than 50% of the cost for flood control features. The recommended project has annual costs of $1,343,000 and average annual benefits of $1,980,400, for a benefit-to-cost ratio of 1.5 to 1.

The City of Mobile is very receptive to the plan presented in this report. Local initiatives are providing for the removal of all other structures within the improved 100-year flood plain. Local planning will also determine the proper use of the vacated lands. Although this expansion can only be accomplished as funds become available, it is an indication of the local sponsor's sincerity in eliminating the flood problems along Threemile Creek. Local support for the project is provided in the Mobile City Commission resolution shown in Section I of Appendix A.

The Draft Interim Survey Report and Environmental Impact Statement was coordinated with Federal, State, and local agencies and other special interests. A public meeting was held in Mobile on 24 June 1982 to present the findings of the study to all agencies and the general public. The plan presented at that meeting was well received by those in attendance. The process of coordination for the study and report is given in Section III of Appendix A.

INTRODUCTION

GENERAL

Threemile Creek originates in western Mobile and flows in an easterly direction for a distance of 14 miles to enter the Mobile River. The creek has a total drainage area of 29 square miles which is fairly urbanized. In the upper 6 miles the average fall of the creek is 26 feet per mile and in the lower 8 miles it is 9 feet per mile. The stream varies in width from 10 feet in the headwaters to 80 feet in the lower reaches. The City's Langan Park, which includes three small dams, is located in the upper 10 square miles of the drainage basin. The upper one-half of the basin is moderately urbanized, but the lower 50 percent of the basin, including the flood plain, is highly urbanized for homes, businesses, and industries. Land use in the basin is 71 percent residential; 4 percent industrial; and 25 percent other uses such as forest, open land, or marsh. The creek has a history of poor water quality due to urban storm runoff, treated and untreated point source discharges, and untreated sewage in flow because sewer lines are frequently broken. Water quality data collected by the Alabama Water Improvement Commission and others indicate that the stream frequently has both a deficiency of dissolved oxygen and a presence of fecal coliform. Stream water quality is discussed further in the Environmental Impact Statement and Environmental Appendix.

Threemile Creek has had a history of flooding, with the most recent occurring in April and May of 1980 and May 1981. A very severe flood occurred on 12-13 April 1980. Rainfall records indicated that from 8-11 inches of rain fell from 5 a.m. on the 12th to some time in the evening of the 13th. This flood damaged about 500 homes, numerous businesses, and caused extensive damage to roads, utilities, and other public facilities. The total damages were estimated to be about $17,000,000. The flood of 17 May 1980 was less severe, but as a result of these two events Mobile County was declared a Federal disaster area.

The flood of 5-6 May 1981 resulted from a frontal system which originated in the west and moved through the area in an easterly direction. Rainfall amounts from this storm ranged from 8 inches at the Weather Service (Municipal Airport) to 12 or 13 inches at unofficial gaging stations operated by the City Engineering Department. Total damages sustained by this flood are about $23,000,000 which includes roughly 1,000 homes and 100 businesses. In comparing the April 1980 and May 1981 floods, the May 1981 flood caused a stage of 1.5 to 2.0 feet higher than the April 1980 flood. The rainfall frequencies of the April and May 1980 and the May 1981 floods were estimated to be 50-, 10-, and 100-years, respectively. Flooding in May 1981 on Threemile Creek and other streams also resulted in Mobile being declared a Federal disaster area. In summary, the city of Mobile has experienced three major riverine floods from April 1980 to May 1981. Further, Mobile also experienced the crippling devastation of Hurricane Frederic in September 1979. For three consecutive years, Mobile was declared a Federal disaster area. The location of the creek and study area are shown in Figure 1. The stream and basin limits are shown on Plate No. 1

STUDY AUTHORITY

Authority for the feasibility study of Threemile Creek is contained in House Public Works Committee Resolutions adopted 12 October 1972 and 11 April 1974. These resolutions requests a comprehensive study for the protection against floods and wise use of flood plains, bank and channel stabilization, restoration and protection of natural lake and estuarine areas, and other purposes. A copy of the resolutions are given in Appendi A. The comprehensive study is still being conducted; however, this feasibility report on Threemile Creek is submitted early due to serious flooding in Mobile, Alabama.

Partial relief to selected flood victims has been provided through insurance, loans, grants, and other measures under programs administered by the Federal Emergency Management Agency (FEMA) and HUD. However, a comprehensive solution to flood problems along Threemile Creek can be provided through implementation of the plan recommended in this report.

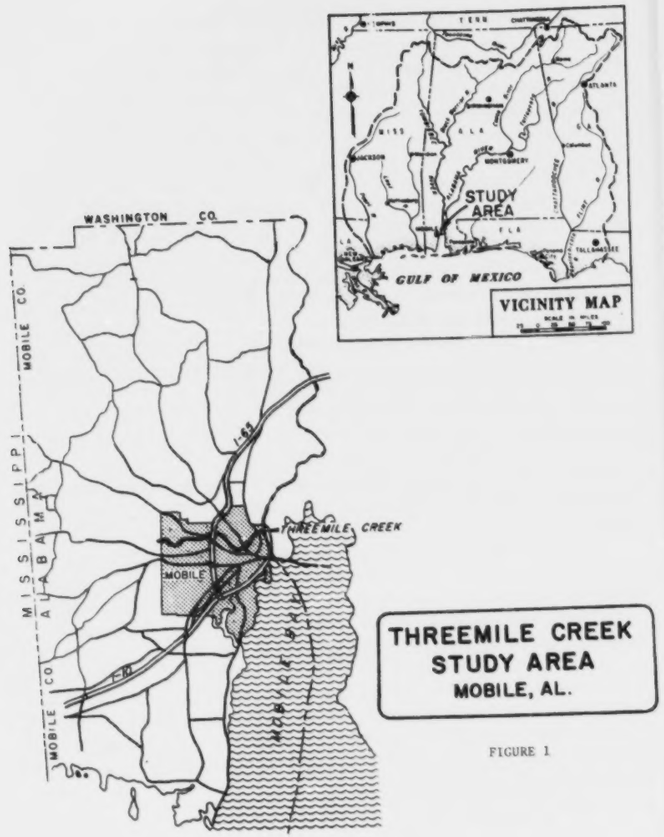

FIGURE 1

PURPOSE OF THE STUDY

As a result of the major flooding along Threemile Creek in April and May of 1980, the Honorable Jack Edwards of the First Congressional District of Alabama, requested that the Corps of Engineers undertake a study to determine if flood damage reduction measures could be justified. This report is in response to that specific request and in partial response to the Congressional resolution adopted in 1972 concerning Mobile and other areas.

SCOPE OF THE STUDY

In response to Congressman Edwards' request, a reconnaissance study was made under Section 205 of the Flood Control Act of 1948, as amended. The reconnaissance report which was submitted to the South Atlantic Division on 30 September 1980 indicated that a project could be justified on Threemile Creek, and the recommendation that further detailed studies be approved under the Section 205 authority was made. The Division Engineer approved the reconnaissance report on 21 October 1980 and Detailed Project studies were initiated in November 1980.

During the formulation of the study several alternatives appeared to be engineeringly and economically justified. However, the costs of these plans were far in excess of the Federal monetary limitations under the Section 205 authority. Since the local sponsor would be required to assume all costs above this limitation, the local sponsor requested the report be converted from a Detailed Project Report (DPR) to a Survey Report. Therefore, further studies under the small projects program were terminated, and this interim feasibility report was prepared in partial response to the Congressional resolution given in Appendix A.

The studies presented in this report concern flood problems along Threemile Creek in Mobile, Alabama. All reasonable alternative plans, including combinations of plans, to solve the flood problems were considered. The

alternatives which are economically feasible and environmentally and socially acceptable were thoroughly evaluated as the study progressed. Consideration was also given to enhancing water quality and the fish and wildlife habitat along the urbanized portions of the creek. Selection of the recommended plan considered economic and environmental factors, as well as the concerns of individuals, organizations, and local, State, and Federal agencies.

CORPS STUDIES

In 1965 the Mobile District made a cursory examination of flooding along Threemile Creek and several other streams in Mobile County. Local officials were advised that the cost of local protection would necessitate Congressional authorization before more studies could be undertaken, and that the feasibility of any project was marginal. No further action was taken by local officials at that time. In 1977, the Mobile District conducted a preliminary investigation of the Threemile Creek flood problems. That study indicated that there were no economically favorable alternatives for flood protection which would warrant Federal participation at that time. After the flood of 5-6 May 1981, the Federal Emergency Management Administration (FEMA) requested that the Corps prepare a map depicting the floodway along Threemile Creek. The floodway study was completed in September 1981 and the mapping and pertinent data were furnished FEMA at that time.

STUDIES BY OTHERS

In 1971 a flood study was completed by the Soil Conservation Service for the city of Mobile. The study included the Threemile Creek watershed; however, no structural improvements to Threemile Creek resulted from the study. In October 1978 the Department of Housing and Urban Development, under the National Flood Insurance Program, prepared flood insurance rate maps for streams in Mobile County, including Threemile Creek. After the flood of May

1981, FEMA developed a mitigation plan under Public Law 90-448, Section 1362, which consists of the acquisition and removal of 29 residential structures from the flood plain. The 29 houses are all located along one reach of the stream and, when the project is completed, open land will serve for green belt and recreation uses. The US Geological Survey, in cooperation with the Mobile District, prepared reports on the floods of 12-13 April 1980 and 5-6 May 1981. The reports included flood maps, high water marks, and other hydrological and meteorological data to document the events. However, no stream gage measurements were made due to the flashy nature of the floods.

RESOURCES AND ECONOMY

Threemile Creek is so named because its confluence with the Mobile River is approximately three miles above the mouth of the river. As shown on Plate No. 1, it meanders through the city from the western city limits to the Mobile River just north of the State Docks. The course of the creek runs through residential, commercial, and industrial areas into marsh and wetlands. By every social and economic criterion, these areas contain a diversity of people, institutions, and problems. There are 21 Census tracts contiguous to the creek, and the population counts, density, educational, and income levels of the residents vary significantly. The tracts are those defined for the 1970 Census and are shown on Figure 2.

POPULATION CHARACTERISTICS

Population within the 21 Census tracts was 73,962 in 1970, which was 23.3 percent of the Mobile County total. The 1979 population in these tracts was estimated to be 75,803, a numerical gain of 2,838 persons, but a loss in the tract's share of the county to 21.2 percent. Seven of the tracts lost residents from 1970 to 1979, and 14 gained. All of the decliners were located

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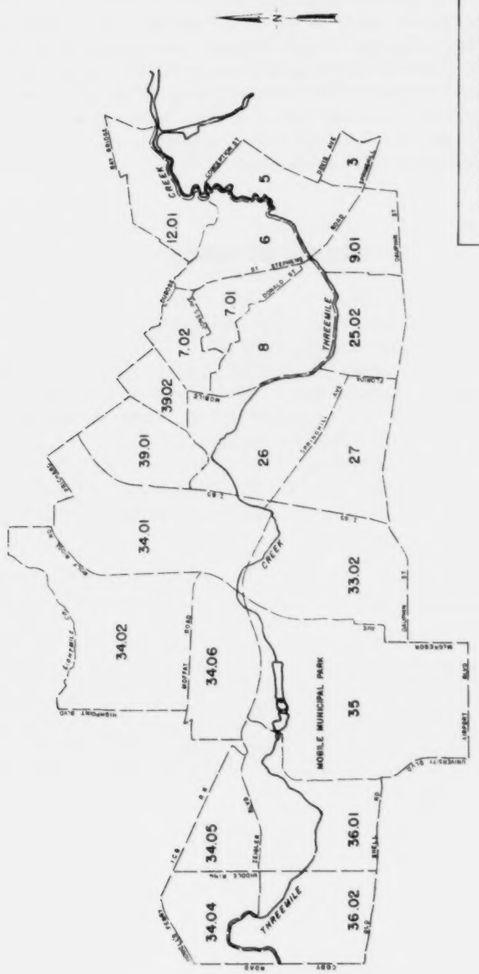


CENSUS TRACTS OF THE THREEMILE CREEK WATERSHED (1970)

FIGURE 2

north of Spring Hill Avenue and east of Interstate 65 (I-65), while nine of the gainers were west of the interstate and the other five were east of I-65. Population figures for the Census tracts are shown in Table 1.

Of the seven tracts which lost residents, six began the 1970's with populations which were overwhelmingly black--exceeding 90 percent in each tract. Ten of the 14 gaining tracts were more than 95 percent white at the beginning of the last decade. There is no reason to suspect that these percentages will show appreciable changes when the detailed 1980 Census statistics are available.

The total number of households (occupied units) in the 21 tracts grew from 20,661 to an estimated 24,150 between 1970 and 1979. While seven tracts lost population during the period, only two experienced a decline in households, reflecting the national trend toward fewer people per unit. The applicable figures for the Threemile Creek area showed a marked decline, from 3.58 persons per unit in 1970 to 3.18 in 1979. Household counts for the Census tracts are shown in Table 1.

INCOME FEATURES

Per capita income levels in 1969 varied from the $940 recorded in Tract 12.01 to $5,168 in Tract 35. By 1978, the lowest income tract was No. 6 and the highest was 25.02. Table 1 displays the per capita income totals for the tracts in current (for the year shown) dollars. All tracts showed increases ranging from 24 percent in 36.02 to 541 percent in 12.01. Median household income in 1978 showed substantial variance from a low of $6,910 in 36.02 to a high of $29,598 in 34.05.

TABLE 1

Population and Household Counts and Per Capita Income by Census Tracts

CENSUS TRACTS	1970 POP.	EST. 1979 POP.	1970 HOUSEHOLDS	EST. 1979 HOUSEHOLDS	PER CAP. 1969 INCOME	PER CAP. 1978 INCOME
3	3,130	2,610	1,050	991	$1,357.00	$4,056.00
5	5,339	4,790	1,651	1,627	1,459.00	4,096.00
6	4,941	4,608	1,214	1,301	1,024.00	3,478.00
7.01	3,965	3,713	943	1,017	1,534.00	4,252.00
8	7,815	7,701	1,964	2,223	1,874.00	4,963.00
9.01	2,676	2,714	1,017	1,116	3,711.00	7,704.00
12.01	3,653	3,406	933	1,000	940.00	6,026.00
25.02	3,432	3,613	1,339	1,593	5,061.00	9,753.00
26	4,273	4,030	1,218	1,312	1,959.00	4,659.00
27	3,428	3,450	1,093	1,209	1,940.00	5,660.00
33.02	3,643	3,913	905	1,087	4,058.00	8,095.00
34.01	1,317	2,114	370	679	2,919.00	5,846.00
34.02	2,013	2,638	549	799	2,793.00	5,895.00
34.04	2,137	2,408	579	748	2,165.00	4,545.00
34.05	2,503	2,719	627	784	3,939.00	8,324.00
34.06	2,496	2,828	707	883	3,326.00	6,965.00
35	6,593	6,985	1,905	2,303	5,168.00	8,480.00
36.01	2,029	2,121	424	525	2,983.00	7,327.00
36.02	3,143	3,666	926	1,190	3,066.00	3,797.00
39.01	4,180	4,374	940	1,112	1,100.00	5,829.00
39.02	1,256	2,404	307	651	1,226.00	4,843.00
TOTALS	73,962	76,803	20,661	24,150		

ASSESSMENT OF PROBLEMS AND NEEDS

Studies undertaken in the evaluation of the existing flood problem along Threemile Creek include hydrologic and hydraulic analyses of the frequency and depth of flooding which have occurred. Analysis of those which can be expected to occur and the effects of these floods have under natural and modified stream conditions was also made. Much of the data used in these analyses were synthesized since streamflow records are sparce and inadequate.

CLIMATOLOGY

Mobile is located in a temperate climate with its weather being influenced by the Gulf of Mexico which lies about 30 miles south of the Threemile Creek basin. The National Weather Service has maintained a first order weather station at the Municipal airport since 1941. This station records precipitation, temperature, wind, and other data. Observed weather data has been collected in the city since 1871.

The summers in this region are warm with the daily temperatures reaching the high eighties and the low nineties. Early morning temperatures start in the seventies and rises rapidly before noon until the air mass is checked by the cooling Gulf breezes. Occasionally, the temperatures will reach above 100° F when the prevailing winds are from the north. Winter weather is mild except for the passage of cold air masses which can lower temperatures for several days. The average winter will have less than 20 days below freezing. The highest and lowest temperatures recorded in the area were 104° F in July 1952 and -1° F in February 1899. The normal annual temperature during the period from 1941 to 1970 is 67.4° F and the normal monthly temperatures range from 51.2° F to 81.6° F.

Rainfall information shows a fairly uniform pattern throughout the year. The maximum rainfall period occurs in the summer and is caused by local convective

thunderstorms which are very intense with short durations. Mobile has afternoon thunderstorms every other day, on the average, during July and August. Occasionally, some summer storms are associated with the passage of hurricanes or tropical storms. Hurricane Frederic, which occurred in September 1979, was the last major hurricane to hit Mobile since 1926; however, several hurricanes have caused river flooding due to the high tides in the Gulf and Mobile Bay. The winter storms usually cover a large area and last 2 to 4 days. These storms are generated from frontal thunderstorms due to large air masses. The normal annual precipitation is about 67 inches and the normal monthly rain ranges from 2.55 to 8.86 inches. Table 2 presents the normal monthly temperatures, the average monthly rain from 1871 to 1980, and the maximum and minimum monthly rainfalls.

BASIN DESCRIPTION

Threemile Creek is one of several streams providing drainage for Mobile, Alabama. It originates in the western part of the city and flows easterly about 14 miles to enter the Mobile River near the Alabama State Docks. The drainage area of the basin at the mouth covers 29 square miles. Average elevation along the basin divide above Interstate 65 is 220 National Geodetic Vertical Data (NGVD) and about elevation 40 NGVD below Interstate 65. The basin is about 8 miles long and has an average width of 3.5 miles. In the upper 5.6 miles the creek has a fall of about 25.9 feet per mile and 9.2 feet per mile in the lower 8.7 miles. The creek bottom varies from 10 to 80 feet wide and has average bank height of 8 feet at Stanton Road.

The stream from Interstate 65 to Stone Street flows through a highly urbanized area. Above the Interstate the basin is moderately developed; however, urbanization is expected to continue in this area. Below Stone Street the creek flows through a tidal marsh area which is undeveloped. The only development in the lower most reaches is near the mouth and adjacent to the Mobile River where railroad and barge shipping interests are located.

TABLE 2

Normal Temperature and Rainfall
and Average Maximum and Minimum Annual Precipitation
at Mobile, Alabama

Month	Temperature (°F) Normal 1/	Precipitation (Inches) Normal 1/	Average 2/	Maximum 3/	Minimum 3/
January	61.1	4.71	4.73	14.59	0.79
February	64.1	4.76	4.98	11.15	1.31
March	69.5	7.07	6.63	20.23	0.59
April	78.0	5.59	5.13	17.69	0.14
May	85.0	4.52	4.71	15.08	0.22
June	89.8	6.09	5.49	26.67	0.53
July	90.5	8.86	7.57	20.50	1.13
August	90.6	6.93	6.62	15.22	1.26
September	86.5	6.59	5.62	16.40	0.47
October	79.7	2.55	3.20	11.43	0.00
November	69.5	3.39	3.73	13.65	0.06
December	63.0	5.92	5.15	11.38	0.53
Annual	77.3	66.98	63.56	92.32	37.15

1/ Based on 1941 to 1970 as referred in 1980 Annual Summary of Local Climatological Data for Mobile, Alabama, (National Oceanic and Atmospheric Administration)

2/ Average monthly precipitation was based on 1971 to 1980 records at city office location before November 1941 and Bates Airport afterward.

3/ Maximum and minimum monthly precipitation were obtained for the period of record. The maximum and minimum annual rainfalls occurred 1881 and 1938, respectively.

FLOOD HISTORY

Threemile Creek has a history of flooding with the most recent events occurring in April and May 1980 and May 1981. The flood of 13 April 1980 was the most severe recorded up to that time and was estimated to be about the 50-year frequency flood. However, the flood of 5-6 May 1981 established a new flood of record and, based on rainfall data collected at the time and on the National Weather Service Technical Paper No. 40, is estimated to be about the 100-year event. Chart No. 1 of Appendix C shows the location of the gages and the rainfall amounts for the 5-6 May 1981 storm. The rainfall amounts for the 13 April 1980 storm are shown in Table 3.

TABLE 3

13 April 1980 Rainfall For Threemile Creek

	Gaging Stations[1]					
Time	FS 2 (3.4%)	FS 21 (39.3%)	FS 22 (17.2%)	FP (37.2%)	Bates (2.9%)	Basin (100.0%)
9 AM	0	0	.02	0	0	0
	.05	.04	.05	.25	.16	.12
10 AM	.05	.04	.05	.25	.16	.12
	.23	.76	.98	1.27	1.25	.98
11 AM	.24	.76	.99	1.28	1.26	.99
	1.62	1.12	1.49	1.26	1.56	1.27
12 N	1.61	1.13	1.49	1.26	1.55	1.26
	.45	.34	.38	.49	.33	.41
1 PM	.45	.33	.37	.49	.33	.40
TOTAL[2]	4.79	4.52	5.82	6.55	6.59	5.55

1/ Location of rain gages are shown on Chart No. 1 of Appendix C.

2/ The rainfall for 12 April was 3.86 inches; therefore, the 13 April rain had little loss.

There are no stream gages on the creek; however, high water marks have been recorded by the US Army Corps of Engineers and US Geological Survey for some flood events since 1965. Table 4 shows the maximum water surface elevations for floods occurring since 1965 as recorded at Stanton Road.

TABLE 4

Maximum Water Surface Elevations for Floods at Stanton Road

Flood Date	Flood Elevation (NGVD)
30 September 1965	13.3
31 December 1965	9.5
18 August 1969	11.6
7 February 1974	12.2
13 April 1975	8.7
22 April 1977	12.2
13 April 1980	15.0
17 May 1980	14.3
6 May 1981	16.7

FLOOD REPRODUCTIONS

Flood reproductions were attempted for the most recent major floods on the creek. Due to the limited amount of data on rainfall and highwater marks for the pre-1980 floods, no attempt was made to reproduce earlier events. Reproduction was first begun based on the April 1980 flood; however, the May 1981 flood occurred during the study and drastically changed the channel geometry. Since the channel conditions during April 1980 no longer existed, and the May 1981 flood closely approximated the 100-year flood, it was decided that a reproduction of the May 1981 flood would provide more accurate data base for

analyzing various conditions. The area rainfall was estimated for the May 1981 storm using data from Chart 1 of Appendix C. The HEC-2 computer model was calibrated using the HEC-1 peak discharges, the 1981 highwater marks, and existing channel geometry with reasonable Manning "n" value adjustments.

HYDRAULICS

The months of March, April, and May are associated with frequent flooding on Threemile Creek. Therefore, backwater computation began with the elevation of the average mean high tide for these months since the first profile point is within the tidal effect of Mobile Bay. In addition, the highest normal tides (spring tide) generally occur at this time. Bridge data was obtained from SCS, Corps, and consultant surveyed cross-sections. Topographic mapping is available at a scale of 1"=1000'. These data were used to develop the geometry of the area to be modeled. Data accumulated during field reconnaissance was also available and taken into consideration for modeling the general hydraulic characteristics of Threemile Creek. Water surface profiles were reproduced for the 2-, 5-, 10-, 25-, 50-, and 100-year frequencies, standard project and probable maximum floods. These are shown on Chart 12 of Appendix C.

A unique characteristic of Threemile Creek is that divided flow during flood stages occurs in the area just upstream of the Illinois, Central, Gulf (ICG) crossing and Springhill Avenue. The divided flow occurs when the flood stages at these points reach elevation 48.0 and 46.5, respectively. Water leaves the basin by flowing beneath Interstate 65 then southward to enter Eslava Creek. The USGS estimated that during the May 1981 flood approximately 384 cfs left the basin at ICG Railroad and 524 cfs left at Springhill Avenue. Since bifurcation (divided flow) can be expected to occur during high stages, the losses were considered for the HEC-2 model. No attempt was made to determine the effects of the added discharges on flood stages along Eslava Creek. These effects will be considered when studies of Eslava Creek are undertaken, unless a project on Threemile Creek eliminates bifurcation.

FLOOD PROBLEMS

In order to assess the magnitude of the flood hazard in the Threemile Creek flood plain, the hydraulic models of frequency at various flood flows were integrated with an economic model of development subject to damage from these flood levels. The result of this process is an estimate of the expected average flood losses from all levels of flooding. To express the dollars of damage anticipated over a 100-year period of analysis, average annual damage is based on the anticipated probability of occurrence of flood events.

The economic model was comprised of potentially damageable property between Conception Street and the dam at Langan Park, at elevations up to the level of the standard project flood (SPF). An inventory of the flood plain was conducted in order to ascertain the number of properties in the flood plain by type, value, and elevation. This inventory is the basis for all subsequent estimates of monetary damage within the SPF flood plain. The flood plain has relatively dense urban development composed of some 1,105 residences and 104 commercial, industrial, or other non-residential structures, as shown in Table 5. The total value of these properties amounts to approximately $121,256,000 as shown in Table 6.

TABLE 5

Flood Plain Property Inventory

Reach	Residences	Commercial	Industrial	Other	Total Non-Residential
1	147	6	–	–	6
2	290	16	–	6	22
3	210	9	–	–	9
4	199	4	–	–	4
5	160	4	–	–	4
6	70	20	1	6	27
7	29	31	1	–	32
TOTAL	1,105	90	2	12	104

TABLE 6

Flood Plain Property Value
($1,000's)

Reach	Residential	Non-Residential	Total
1	$ 4,362.8	$ 256.8	$ 4,619.6
2	8,562,3	1,514.2	10,076.5
3	18,985.0	14,415.1	33,400.1
4	6,440.8	13,510.9	19,951.7
5	4,979.3	2,398.6	7,377.9
6	2,418.0	29,278.5	31,696.5
7	2,504.3	11,629.5	14,133.8
TOTAL	$48,252.5	$73,003.6	$121,256.1
AVERAGE	$ 43.6	$ 702.0	

The stream was divided into seven reaches for flood damage evaluations. Within each reach a gage was selected which would accurately represent the stage frequency data to be used in computing the damages for that reach. The reach limits are:

Reach	Downstream Limit	Upstream Limit
1	Conception St.	Stone St.
2	Stone St.	St. Stephens Rd.
3	St. Stephens Rd.	Yerby
4	Yerby	Fillingim
5	Fillingim	GM&O RR
6	GM&O RR	I-65
7	I-65	Langan Park

The above designated reaches are shown in Chart 1 of Appendix B.

Within each reach there may be several subareas, depending upon the change in water surface elevation of the various floods, development patterns, and other characteristics. A concentrated effort was made to define the reach boundaries and subarea limits based on hydraulic and hydrologic conditions. Each reach or subreach is characterized by a relatively constant or uniform slope of the water surface profiles within the reach limits. The profiles for selected floods from the 2-year frequency up to the SPF were examined along the stream, with reach or subreach boundaries generated at various points where distinct changes in the slope or a pronounced difference, in feet, between the flood profiles occurred. None of the reaches or subreaches have bridges or other constrictions at locations other than the extremities, since such constriction could cause an abrupt change in the elevation or slope of the profile. The cross sections or gages chosen to represent each reach are generally located near the midpoint of each subreach. All subreaches within a given reach were then indexed to the representative cross section for the purpose of aggregating damages by flood stage, for the reach. Chart No. 1 of Appendix B shows the limits of the 7 damage reaches.

The greatest potential for monetary losses due to flooding occurs in reaches 3 and 6 as shown in Table 7. However, reach 2 contains the largest proportion of total residences, 26 percent, followed by reaches, 3, 4, 5, and 1 with 19, 18, 14, and 13 percent, respectively. Nonresidential property value accounts for a large portion of the total property value within reach 3, 43 percent, and for the overwhelming portion of the property value in reach 6, with over 92 percent. There are three hospitals in reach 3 which constitute the majority of the nonresidential property value in this reach. All three hospitals suffered damage from the May 1981 flood, and access to all was temporarily severed by flood waters. Reach 6 has a heavy concentration of warehousing and other commercial activities clustered around I-65. These businesses are associated with building supply, food, diesel engine, electrical equipment, insulation, paper products, electronic equipment, and other large warehousing and distribution activities. Building and inventory values well in excess of a million dollars are not uncommon in this complex, and severe damage was incurred by these businesses in the May 1981 flood. Most of these firms are not fully insured and the heavy losses resulting from the flood have strained

some to the breaking point. Some were able to relocate off the flood plain, but most must remain because of financial considerations, lack of suitable alternative locations, or other constraints.

The estimated damages from all levels of flooding are shown below:

TABLE 7

Total Damage by Reach ($1,000)

Exceedance Frequency[1/]	Reach Number							Total Damage
	1	2	3	4	5	6	7	
70	1.1	2.8	4.1	3.9	1.6	0	0	13.5
50	7.0	68.5	59.2	37.2	16.3	0	44.9	233.0
30	17.6	338.8	354.3	214.0	73.5	454.2	77.0	1,529.4
20	33.0	500.4	662.0	387.5	259.2	1,322.5	97.9	3,262.5
10	60.6	958.1	1,611.4	581.6	501.7	2,247.9	122.6	6,083.9
5	91.4	1,266.8	2,631.2	581.6	860.8	3,669.1	153.3	9,254.2
2	157.7	1,604.5	3,722.1	858.3	1,196.8	4,843.9	188.9	12,572.2
1	193.6	1,823.3	4,493.4	1,079.6	1,516.5	5,869.6	217.5	14,993.6
0.5	275.8	2,141.8	5,524.0	1,289.8	1,668.2	6,068.1	250.1	17,217.7
0.1	437.8	2,636.1	7,843.2	1,780.1	2,123.3	7,211.1	432.1	22,463.7
0.01	898.8	3,476.4	11,079.4	5,069.4	2,529.8	7,965.4	1,252.1	32,271.4

[1/] Percent chance of exceedance in any given year.

The May 1981 flood caused an estimated $23.4 million in damage to property in the Threemile Creek flood plain, including the cost of emergency services and repairs to communications and public utilities, streets, and bridges. Of this total, $12.5 million accrued to residential property, $8.5 million to commercial, industrial, or other nonresidential property, and $2.4 million is assigned to other development. The methodology used to produce these estimates is described in the following paragraphs.

FIELD DATA COLLECTION

The elevations for all flood plain property were determined to the nearest one-tenth foot National Geodetic Vertical Datum (NGVD) through a professional surveyor under contract to the Corps of Engineers. This effort provided the elevation at which damages begin for each structure and the maximum expected flood depth. From these data, an array of flood depths for all structures was constructed to provide a parameter ultimately used to estimate flood damages from all levels of flooding up to the SPF. During the course of the survey, each structure was located on aerial photographs and a reference code was assigned. These map reference codes are cross-indexed to the street address of each structure. The surveyor also determined the use of each structure (i.e. residential, commercial, etc.), type of construction, number of stories, foundation type, average elevation of the ground, and first floor of each structure. The map reference codes and flood elevations were then annotated on reproducible copies of the aerial photographs to facilitate communications in subsequent analyses and structure identification for plan formulation and evaluation.

The value of each structure, contents, and lot were determined from data provided by flood plain occupants, and by property appraisals conducted by Corps personnel. A questionnaire was prepared, from the master list of Office of Management and Budget (OMB) approved questions, and distributed to a very large sample of the nonresidential flood plain occupants to obtain information about the values of various types of businesses, their prior flood damage experiences, and reactions to flood events. In addition to the questionnaire, telephone and personal interviews were conducted to gather additional data and ensure that a reliable sample was obtained for use in subsequent analyses. A response of almost 60 percent of the total nonresidential occupants was obtained and is considered to be reliable for estimating value and damages to businesses similar in size and activity that were not interviewed or did not respond to the questionnaire. The sample data was then used to develop relationships which allowed estimation of similar businesses on a value per square foot basis for the nonsampled/nonresponding firms. These relationships were applied to the square footage of the nonsampled units, as measured from the

annotated aerial photographs of the flood plain. In some instances, estimates of structure values were developed using the Marshall-Swift evaluation guide for the appropriate structure type, in order to produce best estimate possible without further field work.

Residential property values were estimated by District appraisers using comparable sales data, professional appraisal guidelines such as Marshall-Swift, and professional judgement. The residential property along Threemile Creek tends to be stratified into distinct neighborhoods with remarkable homogenity of property values. Because of this stratification the various neighborhoods were sampled, and an estimated range of values was developed for each area. A 5 percent sample of the residential property sales was collected by the appraisers and considered reliable for evaluation purposes. The contents of residential properties were assumed to be equal to 50 percent of the value of the structure, which is a standard assumption in the insurance industry, and by various casualty study centers. Individual condemnation level appraisals for all properties were not performed. However, as a planning and evaluation tool the gross appraisal technique for specific neighborhoods is completely adequate.

FLOOD DAMAGE CALCULATIONS

A complete data base built on field work was assembled which describes the location, elevation, type, and value of each flood plain occupant. This data base was used for subsequent calculations of flood damage estimates for certain levels of flooding along Threemile Creek.

The estimate of damages at any given flood stage depends on three major variables: elevation of the structure relative to the flood stage; value of the building and contents subject to damage; and the damage susceptibility of the building and contents at a given depth of flooding. The elevation and value of developments were determined by field surveys and the damage susceptibility coefficients were assigned from established standards used for all flood

control investigations by the Mobile District. The depth vs. percent damage coefficients for residential property were developed by the Flood Insurance Administration (FIA), while nonresidential damage coefficients came from a variety of sources. The Mobile District has adopted certain depth-percent damage coefficients in use by other districts after modification to reflect conditions encountered in this area. Studies in other portions of Mobile District have validated the use of these coefficients as generally reliable indicators of the level of damage which can be expected from a given depth of flooding for different types of nonresidential property. The use of these coefficients tended to produce fairly reliable aggregate estimates of the damages which would occur from a repetition of historical flood levels. Due to the similarity of the Threemile Creek flood plain to other areas in the Mobile District, certain coefficients were adopted as reliable indicators in this study. Studies in other areas also addressed emergency costs and communications and utilities damages resulting from flooding. The result of these studies showed a high degree of correlation with the coefficients contained in the currently used stage vs. damage computer program in use by the Mobile District.

The computer program assigns a damage value to communications/utilities and public health and relief or other emergency services, based upon the level of damages to residential, commercial, and industrial property. The model assumes in this approach that the level of emergency services required, as well as the damages to streets, sewers, telephone lines, and other utilities, is directly related to the magnitude of flood damages accruing to other property in the flood plain. Since 1980 the city of Mobile has spent $2.5 million to repair damages from three floods on Threemile Creek. Emergency costs of about $500,000 were incurred by the Red Cross and others specifically for the May 1981 flood. Actual restoration cost for damages incurred for the May 1981 flood is unavailable since many repairs have not been made due to funding shortages. However, damage estimates developed for this report include damages to utilities, streets, and emergency services, resulting from the flood hazard. Table 8 shows damages resulting from the May 1981 flood.

TABLE 8

May 1981 Flood Damages

Reach	Residential	Nonresidential	Other	Total
1	$ 569.0	$ 26.2	$ 73.1	$ 668.3
2	1,751.6	155.6	234.6	2,141.8
3	6,346.7	637.4	859.1	7,843.2
4	1,585.2	0	194.9	1,780.1
5	830.5	655.0	182.7	1,668.2
6	976.0	6,279.7	708.7	7,964.4
7	463.1	740.8	148.2	1,352.1
TOTAL	$12,522.1	$ 8,494.7	$ 2,401.3	$23,418.1

The stage-damage curves for each reach, from which these estimates were made are shown on Chart No. 2 of Appendix B. The process of integrating the hydrologic and hydraulic data shown on Chart Nos. 2 through 5 of Appendix C yields a damage-frequency curve. The area under the curves equals average or expected annual damages. These integration computations can be made manually or by a variety of computer programs. The HEC program "Expected Annual Damage" (EAD) was used in this study, primarily because of the ease of data modification when analyzing alternative plans.

As Table 9 shows, the average annual damages by category under present conditions of flood plain development totals $1,853,100 with reaches 2, 3, and 6 having the greater damage. Data in this table clearly illustrates the dominance of residential damages in most reaches.

TABLE 9

Average Annual Damage Existing Conditions
($1,000's)

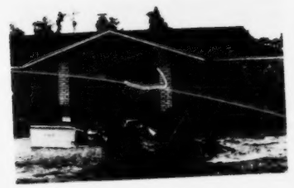
Reach	Residential Struct.	Residential Cnts.	Commcl.	Public	Industrl.	Transp.	Commun./ Utility	Emerg.
1	$ 10.4	$ 6.3	$ 2.9	$ 0	$ 0	$ 0.4	$ 0.7	$ 1.3
2	143.5	97.8	12.9	2.3	0	5.2	9.8	16.8
3	256.2	178.6	2.0	0	0	8.8	16.6	28.4
4	96.8	62.0	0.8	0	0	3.2	6.1	10.4
5	54.7	37.2	48.1	0	0	2.8	5.3	9.1
6	26.1	17.9	533.5	0.5	0.7	22.1	22.0	37.6
7	26.8	20.5	0.3	0	0	0.9	1.8	3.1
TOTAL	$616.5	$420.2	$600.5	$2.3	$0.7	$43.4	$62.3	$106.7

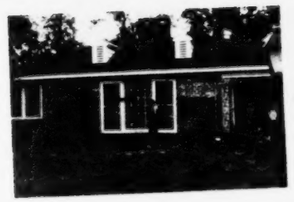
Photographs of some houses and streets flooded in May 1981 are shown on the following pages.

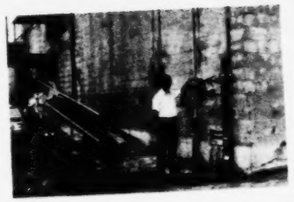
PLAN FORMULATION

Plan formulation for this report recognizes the criteria and methodology needed to respond to the basic objectives of achieving flood damage reduction. The process considered structural and nonstructural measures giving full consideration to environmental, sociological, engineering, and economic values and constraints.

A wide range of alternatives was developed in response to formulation and evaluation criteria. The basic objectives for plans evaluated, in addition to achieving flood damage reduction, were providing for National Economic Development (NED), and Environmental Quality (EQ). Throughout the process of these







← High Water Levels of the May 1981 Flood

Aftermath of the May 1981 Flood

impacts were measured and their contribution to Regional Development (RD) and Social Well-Being (SWB) were considered.

PLANNING CONSTRAINTS

The most significant planning constraints on the study of Threemile Creek were in defining flood problems and the evaluation time allowed to identify a solution to flooding. This time element leaves the flood plain occupants vulnerable to continued flooding which is a threat to their safety and well-being. Other constraints associated with the study are:

- o Providing a complete and comprehensive plan for reducing flood damages.
- o The acceptability of the recommended plan.
- o Providing a plan which would not be detrimental to the environment.

PLANNING OBJECTIVES

Effective plan formulation can only be accomplished by identifying the detailed objectives necessary to guide the planning process. The contributions listed below form a basis from which alternatives evolve.

- o Contribute to the economic value of existing properties in densely populated urban areas resulting from frequent overbank flooding along Threemile Creek.
- o Contribute to water quality for compliance with state water quality standards for health, aesthetics, and the sustenances of fish and other aquatic life in the creek.

- o Contribute to streambank wildlife habitat for the sustenance of urban wildlife species along the creek.
- o Contribute to outdoor recreation opportunities consistant with local and regional needs.
- o Contribute to the preservation of archaeological and historical resources for cultural and historical purposes.

TECHNICAL CRITERIA

The following technical criteria were adopted for use in developing alternative plans and in the selection of the recommended plan:

a. Protection should be provided against a design flood of magnitude greater than the flood of record if feasible and justified.

b. Protective works should be planned to eliminate all flooding for the design flood.

c. Protection plans must be capable of being constructed and must be designed to last through the planning period or to be replaced with like structures.

d. The recommended plan of protection must be compatible with the overall scheme for the comprehensive plan developed by the city of Mobile.

ECONOMIC CRITERIA

Established economic criteria insures that all alternative plans be evaluated on a comparable basis to meet the planning objectives as follows:

a. All plans must have net national economic development benefits unless the deficiency is the result of benefits foregone or additional costs incurred to serve the environmental quality objective.

b. Each separable unit or element of a plan must provide benefits at least equal to its cost unless justifiable on a non-economic basis.

c. Each plan, as ultimately formulated, provides the maximum net benefits possible within the formulation framework.

d. The costs of alternative plans are based on current unit prices.

e. The benefits and costs are in comparable economic terms to the fullest extent possible.

f. Annual benefits and costs are based on a 50-year amortization period and discount rate of 7-5/8 percent, as determined by the Water Resources Council.

SOCIOECONOMIC AND ENVIRONMENTAL CRITERIA

Criteria for socioeconomic and environmental considerations were derived in part from values identified in the National Environmental Policy Act of 1969 (PL 91-190) and Section 122 of the River and Harbor and Flood Control Act of 1970 (PL 91-611).

a. Plans should be formulated to maximize the beneficial and minimize the adverse effects of the improvement on:

- o Man-made resources
- o Water Quality
- o Air Quality
- o Aesthetics

b. Plans should minimize and, if possible, avoid:

- o Destruction of community cohesion
- o Injurious displacement of people
- o Disruption of desirable community growth
- o Undesirable alteration of recreational opportunities

c. Consideration should be given to protection of historic, archaeological, and other public interest areas.

d. Plans should not significantly increase noise pollution during construction or create conditions that will tend to raise the overall noise level of the area over the life of the considered improvement.

PLANNING CONCEPT

The formulation of alternative plans was conducted through an iterative four-stage process:

- o Possible Solutions - Identification of measures available to address problems and opportunities.
- o Development of Alternatives - Design of alternatives to meet identified problems and opportunities.
- o Plans to be Considered Further - Evaluation and screening of alternatives.
- o Development of Decailed Plan - Design of new alternatives or refinement of alternatives considered previously.

Plan formulation proceeds through these stages until only those alternatives that can be favorably recommended for solving the flood problem remain for

consideration. With further analysis, the views of concerned Federal and State agencies, local representatives, and private interest, detailed design and evaluation was completed for the plan or plans carried over from earlier stages with the endorsement of the local sponsor. Through this process the selected plan was derived and is presented in this report.

POSSIBLE SOLUTIONS

Several alternative measures to satisfy the problems and needs of the area are possible. These solutions may be divided into the two broad categories of nonstructural and structural measures. Nonstructural measures include zoning and building code regulations, flood proofing of both individual buildings and single land tracts, and permanent evacuation of flood plain areas. Structural measures include reservoirs, channel modifications, stream diversion and levees. Although a combination of nonstructural and structural measures is possible, such plans were not designed in the initial phases of the study.

NONSTRUCTURAL MEASURES

Nonstructural measures do not attempt to reduce or eliminate flood water levels. They are oriented toward lessening the damaging effects of floods by such means as regulating future development, flood proofing of existing structures, and the partial or complete evacuation from the flood plain. Several nonstructural measures that may be implemented are described briefly in the following paragraphs.

Zoning

Zoning is a legal measure that state, county, or local governmental agencies could implement and enforce to effectively reduce the flood damage potential

and provide a planned program of development and land use. Zoning ordinances could designate the channel and those portions of the adjoining flood plain required for passage of floodwater in accordance with the degree of flood protection desired. Other areas of the flood plain where water is ponded could be developed, provided that adequate measures were taken to reduce the potential damage consistent with the risk involved and also provided that no additional flooding or damages occur elsewhere as a result of development. Limiting elevations below which development would not be permitted, could be established. Zoning measures insure the safekeeping of property for the health, welfare, and safety of the general public. The City of Mobile is currently enrolled in the Flood Insurance Program which requires the implementation of these measures in accordance with the National Flood Insurance Act of 1968, as amended.

Subdivision Regulations

Subdivision regulations are used by local governments to specify the manner in which land may be divided. Regulations could be adopted that could state requirements for street widths and minimum elevations, drainage structures, minimum building elevations, and restrictions on location to provide adequate outlets for the passage of floodflows and minimize flood damages.

Building Codes

Local governmental agencies could adopt building code regulations that would assist in minimizing future flood damages. The codes would set forth standards for preventing or limiting future development detrimental to the natural function of the flood plain, require on-site flood detention, land treatment, and restoration of diminished environmental values.

Flood Proofing

Flood proofing is employed primarily for the reduction or elimination of flood damages to existing structures. Flood proofing includes, but is not limited to:

a. Raising existing buildings;
b. Providing individual dikes around existing structures;
c. Providing permanent or temporary water-tight covers for all openings;
d. Protecting roads and utilities; and,
e. Anchoring floatable structures and facilities.

Flood Forecasting

Reliable and timely forecasts of floods can be a valuable asset in reducing flood losses. However, due to the small size of the Threemile Creek basin and relatively fast runoff rate of rainfall, floods are generally flashy and prevents many potential benefits associated with flood warning.

Evacuation

Permanent evacuation of flood plain areas could be used to reduce the flood damage and restore the natural function of the flood plain. Evacuation measures could involve removal of all buildings and other developments from the flood plain. Lands acquired in this manner could be used for parks or other purposes that would not interfere with floodflows or result in significant damage from floods. Also, some flood plain land could be left for their natural scenic values.

Other Measures

Other preventive measures such as warning signs, tax adjustments, restrictions on building financing, urban redevelopment, and reconstruction of bridges and culverts could be provided for flood damage reduction. These measures could effectively reduce or eliminate future damage in the flood plain.

STRUCTURAL MEASURES

Structural measures differ from nonstructural measures in that they are intended to keep floodwaters away from damage susceptible property, rather than keep damageable property away from the floodwater. Structural measures, as the name implies, usually involve the construction of large or extensive flood control facilities. Structural measures considered for Threemile Creek include flood control reservoirs, levee protection, channel clearing and snagging, channel modification, and stream diversion.

Reservoirs

The function of a flood control reservoir is to temporarily store a portion of the floodwater in such a way as to minimize flood stages downstream. This requires the availability of an upstream impoundment site capable of providing sufficient storage.

Levees

Levees are essentially longitudinal dams constructed roughly parallel to a stream rather than across it to provide a barrier against flood stages. Because a levee cuts off natural drainage patterns into the stream, provisions must be made to accommodate interior runoff occurring behind the levee.

Clearing and Snagging

This measure involves the removal of snags, debris, and drift in a channel or floodway to provide a more efficient passage of floodflows. The subsequent reduction of the resistance to water flow of the channel cross section will cause a reduction in flood stages.

Channel Modification

This type of measure utilizes the lowering of flood stage levels through improving the hydraulic carrying capacity of a stream channel and can include any changes in the channel configuration from minor bank shaping to a complete channel diversion. Usually, it implies the widening and deepening of an existing channel and straightening of bends to provide a larger cross-sectional area and steeper bottom slope.

DEFINITION OF ALTERNATIVES

During the early stages of the investigation an effort was made to determine which types of alternative measures would be suitable for providing maximum favorable reduction of flood damages along Threemile Creek. There were four basic types of alternatives which appeared to be implementable based on existing development and characteristics of the stream and basin. The four basic methods are upstream retention, stream diversion, channel modification and nonstructural. These methods were used as the basis for studying a range of possibilities which included 14 different alternative plans.

There are two structural alternatives for flood damage reduction which were found to be ineffective and impracticable and therefore dropped from further consideration during the early stages of the study. These methods were clearing and snagging the stream and levee protection.

Clearing and snagging the channel would not cause a sufficient reduction in flood stages to provide the degree of protection needed. The magnitude of flooding was too great to lend itself to this limited type of improvement. The size of the existing creek and other factors seemed to have the most effect on flood stages and a clearing-out of the creek would not significantly affect the flood levels.

Since damages occur on both sides of Threemile Creek, levee systems would have to be built on each side of the creek. Due to dense development adjacent to the creek, this type of alternative would require extensive relocation of structures and property acquisition. Such a plan would involve earth embankment for about 10 miles and provisions would have to be made to remove the rainfall runoff occurring behind each levee. Project cost and narrowness of the flood plain make this alternative impracticable.

DESIGN OF ALTERNATIVES

Upstream Impoundment

The reconnaissance study focused on the possibility of constructing a dam on the upstream reaches within Langan Park where an existing dam was located. The existing dam consisted of an earth filled section and sheet pile, fixed crest spillway. Studies made for the reconnaissance report included adding to the existing earth filled section and providing a notched spillway to limit the discharge and provide, temporarily, storage of water in the park below the level of existing development. The reconnaissance studies indicated that the flood reductions achieved downstream would provide the benefits necessary to support the cost of such construction and would be within the financial range of the Section 205 authority. The investigation of alternatives logically began with this plan. After the May 1981 flood, the city rebuilt the dam and shifted its axis downstream a few feet. After careful consideration, it was decided not to alter the existing dam due to the lack of data on its foundation and method of construction. The axis of the considered dam was therefore moved 300 feet upstream of the city's dam. The 300 feet provides adequate room for stilling basin without infringing on the existing dam.

Three plans were considered for impoundment, varying only by the type of spillway used to control the outflow. The dam would be an earthfilled embankment extending from the right and left bank toward the center of the stream. The embankment section would have a total length of 2,300 feet with a maximum

height of 24 feet near the creek. It would have a top of 12 feet with side slopes of 1 vertical and 3 horizontal.

Plan 1 considered a concrete spillway section with three 35-foot wide vertical lift gates. This possibility was investigated because gated spillways are the most effective means of controlling the outflows and thereby regulating downstream flood stages.

Plan 2 considered a concrete, fixed crest spillway having four slotted openings 30 feet wide and 2 feet deep approximately 7 feet below the top of the spillway. The slotted openings would allow outflow whenever the pool exceeds elevation of 80 feet. When the stage reached the top of the fixed crest spillway at 87 feet NGVD, inflow would equal outflow. At this point, the structure would have little or no effect on downstream flood stages.

Plan 3 considered the use of sheet piling to provide a fixed crest spillway. The sheet pile section would be a fixed crest type and would function similar to the one defined in the reconnaissance report. The spillway would be provided with a slotted section 80 feet wide which would allow discharge to begin at a low level with regulation as headwater increased. The discharge would increase as the head increased until it reached the top of the 447-foot long fixed crest. At this point, the discharge would be uncontrolled with inflow equaling outflow.

All three plans included a stilling basin below the spillways to dissipate the flow and control erosion downstream. There are no structures within the impoundment which would require relocation. However, the Art Gallery located on the southside of the impoundment area would require a low level dike for protection when the lake reached its highest level. These three plans for a dam in Langan Park are shown on Plate No. 2.

Stream Diversion

This type of alternative provides for interception of flood flows from Threemile Creek just upstream of Interstate 65 and would divert the water to

another stream system for reduction of flood stages along the creek downstream of that point. Four different plans for stream diversion were evaluated utilizing hydrologic and hydraulic models.

Plans 4 and 5 considered diversion to Montlimar Creek which is south of Threemile Creek. The diversion to Montlimar Creek would consist of a channel from Threemile Creek approximately 5,000 feet upstream of Interstate 65 and continue southward to join Montlimar Creek near Springhill Memorial Hospital. Montlimar Creek would be enlarged from that point to Halls Mill Road. The total length of this channel would be 6.3 miles. Two channels having 100- and 75-foot bottom widths were evaluated for stream diversion. Their design capacities are for the 50-year and the 25-year flood discharges. These plans would require replacement or modification of six bridges for the larger channel and five for the smaller. Two new bridges would be required under Springhill Avenue and Old Shell Road.

Plans 6 and 7 considered diversion northward to Eightmile Creek. It would leave Threemile Creek between Moffat Road and I-65 and continue northward for a distance of 3.4 miles to enter Eightmile Creek 1,000 feet downstream of Bear Fork Road. Eightmile Creek would be modified for a distance of 4,000 feet downstream of that point. Two plans were considered for this diversion which included 100-foot and 50-foot bottom widths. These two plans were designed to contain the 100- and the 25-year flood discharges. For either plan two new bridges would be required under Wolf Ridge and Bear Fork Roads.

Diversions to either Montlimar or Eightmile Creek would require the construction of a sheet piling dam across Threemile Creek immediately downstream of the channel exit to force flood flows into the diversion. The dams would be constructed with an overflow section to allow flows above the design capacity and normal low flow to continue down Threemile Creek. The diversion routes for these four plans are shown on Plate No. 3.

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Channel Modification

Plans 8, 9, and 10 considered the effects of instream channel modification on flood stage reductions. The limits of channel modification are the same for all three plans, but bottom widths vary and stream slope for plan 10 was changed. The modification would begin 50 feet upstream of Conception Street at Station 47 + 20 and end at Station 376 + 00 about 6,300 feet upstream of I-65. A range of channel sizes was considered to determine the combination of modified stream geometry which would achieve maximum efficiency and cost effectiveness.

Plan 8 consists of enlarging the bottom width to 120 feet from Station 47 + 20 to Station 308 + 50 at the downstream side of I-65. Beginning at the upstream side of the Interstate the channel would have a 100-foot bottom width to Station 376 + 00. The plan includes 5 drop structures located at Stations 165 + 80, 234 + 60, 268 + 40, 308 + 50, and 350 + 00 to modify the bottom slope and control erosive velocities. The side slopes would be 1 vertical on 3 horizontal and would be grassed for slope protection. Relocations would include 68 homes and three businesses and replacement or modification of eight bridges including three railroad bridges. The plan would also include relocation or modification of pipelines and other utilities within the construction area.

Plan 9 consists of providing a channel with bottom width of 90 feet from Station 47 + 20 to Station 308 + 50 at I-65, and a 75-foot bottom upstream to Station 376 + 00. The plan would have side slopes of 1 vertical on 3 horizontal and require the same drop structures located as given in plan 8. The required relocations would include 56 homes and two businesses and replacement or modification of eight bridges.

Plans 8 and 9 established the parameters which could be used to determine if further consideration should be given to instream channel work. Considering the range of channel dimensions, bottom slopes and stage reductions provided, and careful analysis of these factors, led to development of a plan providing

a variable bottom width and flatter bottom slope. Therefore, plan 10 reduces excavation requirements, yet provides substantial flood protection.

Plan 10 provides for enlarging the channel to 148-foot bottom width from Station 47 + 20 to Station 160 + 69 at Stanton Road. At this point, the bottom width would transition to 90 feet and continue upstream to Station 227 + 80 at Fillingim Street. From Fillingim Street to the downstream side of I-65 the bottom width would be 75 feet and beginning on the upstream side of the Interstate to Station 376 + 00 it would be reduced to 70 feet. The plan would require drop structures at Stations 227 + 80, 268 + 40, 308 + 50, and 329 + 80 to control stream slope and eliminate erosive velocities. This alternative would require the relocation of 27 homes and two businesses and the replacement or modification of 8 bridges. The channel modification limits for plans 8, 9, and 10 are shown on Plates Nos. 4, 5, and 6.

Flood Plain Evacuation

The nonstructural plans developed for Threemile Creek included four different levels of flood plain evacuation. Plans 11, 12, 13, and 14 were evaluated using stages resulting from the 2-, 5-, 10-, and 25-year flood plains as the levels of evacuation. This range of flooding was selected to determine which, if any, nonstructural plan could be justified by incremental analysis. Evacuation requirements for the nonstructural alternatives are shown below:

Type of Acquisition	Flood Plain Frequency			
	2-Year	5-Year	10-Year	25-Year
Homes	124	320	531	622
Acres of Land	278	475	528	614

Cost estimates for these alternatives included provisions as required by the "Uniform Relocation Assistance and Real Property Acquisition Policies Act" of

1970 (PL-646). After removal of the structures, the flood plain would be landscaped, including the planting of a variety of trees and shrubs for aesthetic enhancement. The flood plain area for Threemile Creek is shown on Plate No. 7.

EVALUATION OF ALTERNATIVES

A matrix and summary of the alternatives investigated for this study are shown in Table 10. Included in this table are cost, benefits, and other data necessary and useful in selecting the alternative which would best solve the flooding problems along Threemile Creek.

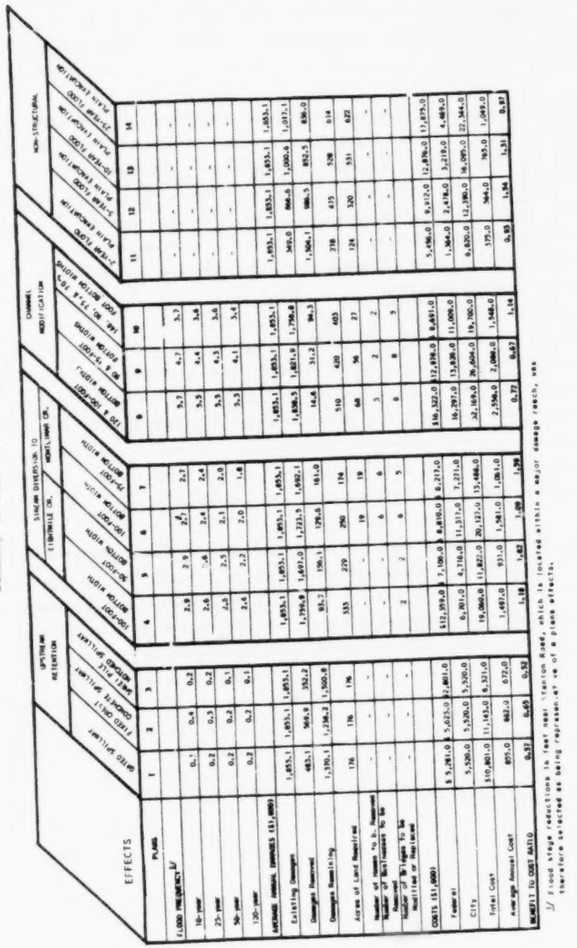
SCREENING OF ALTERNATIVES

Of the alternative plans considered, upstream impoundment would be the least damaging to the environment since the number of acres required for the structures would be minor and impoundment would not significantly damage trees and other vegetation due to the short duration of inundation. However, hydraulic studies indicated that the effects of the dam on flood stages downstream would be minor. Slight stage reductions were realized on frequent events immediately downstream of the structure; however, these reductions decrease rapidly and were hardly noticeable further downstream in the major damage reaches. As a result of the ineffectiveness of the impoundments to produce the needed flood protection, this type of alternative was dropped from further consideration. Evaluation factors are shown in Table 10.

The stream diversion plans proved to have significant adverse environmental and social impacts. These impacts would be felt in the areas where water would be diverted, such as Dog River, the outlet source for Montlimar Creek and Eightmile Creek. Water quality in Dog River is considered to be fair at this time; however, it would be further degraded by adding urban runoff from

TABLE 10

Summary of Plans Investigated



the Threemile Creek watershed. In addition, there are existing drainage and flooding problems in the Montlimar Creek area and property owners in this area have voiced opposition to diversion of Threemile Creek waters through Montlimar Creek.

The environmental impacts on Eightmile Creek would be even more significant. Stream water, riverine vegetation, and fish and wildlife habitat are of fairly high quality and the addition of urban runoff from Threemile Creek, plus the modification of 4,000 feet of Eightmile Creek, would adversely impact the environment. This diversion would also cross into another municipality adjacent to Mobile which withdraws part of its drinking water from Eightmile Creek. The Mayor of Prichard has voiced stringent objections to diversion of water to Eightmile Creek.

As shown in Table 10, the benefits that could be realized by stream diversion reflect economically justified projects. In addition, good reduction in flood stages is provided downstream of the diversion which makes these alternatives attractive. However, the environmental and social impacts are quite severe, and unresolvable controversy could develop if this alternative were selected. Based on these negative impacts and the availability of other attractive alternatives, stream diversion was not considered further.

The channel modification alternatives would have some negative impacts of a short-term nature. These impacts would occur mainly during construction. An increase in turbidity and the loss of a small amount of streambank vegetation would result from project installation. The degradation of stream benefits to fish and wildlife would not be of major significance since very little, if any of the stream, is still in its natural state and existing water quality in the stream is very poor. Vegetation which would be lost as a result of construction would eventually be replaced by nature in land area gained for rights-of-way from removal of structures. There would be additional open or green space opportunity to restore losses in wildlife habitat, but the instream impacts cannot be avoided.

As shown in Table 10, plan 10 has a positive economic benefit while plans 8 and 9 are slightly below unity. Also, the data shows that the greatest degree of floodstage reduction can be achieved through channel modification. Based on apparent feasibility, the high degree of protection, minor environmental impacts, small residual damage, and local preference, this alternative was considered to warrant further study.

The nonstructural alternatives would not have adverse long-term effects on the quality of the environment since the stream would be left in its present state. There would be minor temporary increases in turbidity and sediment transport associated with evacuation activity, but home sites would quickly become grassed.

The development of parks or other types of recreational areas and landscaping after removal of the structures would produce a positive benefit to the environment. As shown in Table 10, plans 12, 13, and 14 appear to be feasible. In addition, this type of flood damage reduction measure would not have long-term adverse impacts on the environment of Threemile Creek. Therefore, the alternative for flood plain evacuation was retained for further consideration.

DEVELOPMENT OF DETAILED PLANS

The selection of plans for detailed consideration involved the comparison of evaluation factors which were traded-off in the formulation process as outlined earlier. During this screening process, plans which would solve the flood problem and meet other needs of the area surfaced for further consideration.

Also, during the workshop held 17 December 1981, each alternative and its effects were explained in detail and participants, which included a large number of flood plain residents, were asked to indicate their preference. The results showed a large majority in favor of channel modification because of

the obvious higher degree of flood protection. Flood plain evacuation was second choice. Workshop participants were also asked to suggest or propose additional alternatives. This provided a test for completeness and it was found that many residents and the local sponsor favored a combination of channel modification and evacuation. The local sponsor also favored a high level of flood protection, up to the 100-year frequency, if it could be justified.

Through this review of evaluation factor and of input received during the workshop from flood plain occupants and the local sponsor, it was decided that the formulation process would not be complete until a more comprehensive plan was analyzed in detail. A combination of channel modification and flood plain evacuation was designed to provide the maximum degree of protection economically justifiable as a total project. Although this is in contrast to the current Federal policy of focusing on incremental justification of each item in the NED plan, it was felt that the comprehensive plan could then be reduced incrementally in scope until the NED plan was identified.

DESIGN OF COMPREHENSIVE PLAN

Although it is possible to reduce flood damages by either channel modification or flood plain evacuation, the acceptability of nonstructural plans alone is marred by the limited degree of protection and the magnitude of social impacts with extensive relocation of homes and businesses. Since the nonevacuated structures such as the three hospitals and many commercial establishments in shopping areas would not be benefited by evacuation plans, some other type of protection would be needed. Of all plans considered, channel modification would result in the highest level of flood protection for developments in the flood plain. However, its effect on flood stages in the lower reach of the creek is small as compared to upstream areas due to stream slope and low topographic relief. Therefore, provision of the most effective plan for reduction of flood losses along Threemile Creek could be accomplished by combining channel modification with evacuation. With assistance from the local sponsor, recreation facilities are also planned. Some are provided within the

project rights-of-way including lands to be obtained for the flood plain evacuations, and others are provided within a new park area to be acquired by the city.

PLAN COMPONENTS

The structural portion of the comprehensive plan would consist of enlarging the stream for a total distance of 5.6 miles, proper disposal of the excavated material and the landscaping of the disturbed areas for appearances and slope protection to control erosion. A right-of-way of 122 acres will be required for construction and maintenance, five bridges will be modified and three replaced, four drop structures will be required and the replacement or modification of sewer, water and gas lines, and other utilities as required. The removal of 42 houses and two businesses from the project right-of-way will also be required.

The nonstructural portion of the plan will be limited to the lower reach of the stream downstream of Stone Street (Davis Avenue) on both sides of the creek. There would be 68 houses and 5 businesses removed from the flood plain. The cleared areas would be graded and landscaped and be used as a green belt and recreation area. Existing recreation development within the Threemile Creek watershed provides a certain amount of opportunity for hiking, bicycling, picnicking, baseball, softball, football, basketball, and tennis. Facilities will be added to increase hiking, bicycling, picnicking, and baseball opportunities. These new developments will also include one multiple-use court, seven bicycle racks, one waterborne toilet, four drinking fountains, and 889 sq. yards of parking. The comprehensive plan is shown on Plate No. 8.

CHANNEL MODIFICATION

The channel modification portion of the flood control plan would begin at station 82 + 70, 1,990 feet downstream of the Stone Street crossing. The channel

would have a bottom width of 148 feet at this point and maintain that width for a distance of 7,799 feet to station 160 + 69. At this point, the channel would transition to a 90-foot bottom width and would continue upstream for 6,580 feet to station 227 + 80, at the lower most drop structure. Immediately upstream of the drop structure the channel would have a 75-foot bottom width and continue upstream for a distance of 8,070 feet to station 308 + 50 on the downstream side of Interstate 65. On the upstream side of Interstate 65 at station 313 + 30 the channel would have a 70-foot bottom width and continue to the upstream limits of the project at station 376 + 00, a distance of 4,620 feet. At this point, the modified channel would transition back into the existing channel. The channel side slopes would be 1 vertical on 3 horizontal throughout and would be grassed for stability to minimize erosion. Details of the channel modification plan are shown on Chart Nos. 13 through 16 of Appendix C.

Four drop structures would be required in the plan to reduce slope and control erosive velocities. Each structure would consist of sheetpile weirs with riprap end sills and would be located at stations 229 + 80, 268 + 40, 308 + 50, and 329 + 80. At each structure the channel bottom and side slopes would be protected by riprap, which would extend 25 feet upstream and 50 feet downstream of the weir. Details of three of the drop structures are shown on Chart No. 17 of Appendix C and the fourth one at Interstate 65 (station 308 + 50) is shown on Chart No. 18 of Appendix C.

Transition sections would be required at stations 160 + 69 and 376 + 00. The first section is located where channel dimensions change and the second is provided where the improved channel returns to the existing channel. The transition at station 160 + 69 would be 131 feet long with riprap extending through the section for a distance of 181 feet. The transition at station 376 + 00 would be 80 feet long with riprap for a distance of 155 feet. The locations of transition sections are shown on Chart Nos. 14 and 16 of Appendix C and details of each are shown on Chart Nos. 19 and 20 of Appendix C.

Bank stabilization structures will be required at stations 204 + 70 and 261 + 00 where storm drains intersect the main channel. Details of these riprap-type structures are shown on Chart No. 21 of Appendix C.

BRIDGE MODIFICATIONS

There are 10 bridges located within the limits of the comprehensive plan. Of these, eight will require modification or replacement. Three of the bridges are railroads belonging to Illinois Central Gulf. These bridges will require modification due to the spacing between piling bents. They will need to be modified to provide a clear span crossing the improved channel to minimize the entrapment of logs and other debris during flood stage. Street bridges at Stanton Road and Mobile Streets will require extension in order to gain the necessary cross sectional openings to pass design flows. Bridges which are considered unsalvageable are Fillingim Street, St. Stephens Road, and Stone Street where replacement will be required. Data on these and other bridges are given in Table 11 and sections are shown on Chart Nos. 22 and 23 of Appendix C.

RIGHTS-OF-WAY AND RELOCATIONS

Approximately 122 acres of land will be required for rights-of-way along the creek for construction and subsequent maintenance of the flood control channel. Acquisition limits extend outward 20 feet from the top of cut along each bank. The number of acres to be purchased cannot be precisely determined at this time since the City already owns some of the lands along the creek and is in the process of acquiring additional lands. The development of project economics considered land needs of 122 acres.

The relocations required for channel modification include houses and commercial buildings, pipelines for sewer, water and gas, and telephone, electric and other communication lines. There are 42 homes and two businesses to be removed from the construction right-of-way for the channel. All utility crossings will be lowered below the improved channel bottom or raised above the design flows to eliminate debris entrapment. Sewer, water, and other pipes paralleling the creek within the project area will be moved back to

TABLE II

Bridge Data

Station	Name	Road Width (Ft.)	Low Steel Elev.	Opening Area (Ft.[1])		Bottom Inv. Elev.	
				Existing	Imp.	Existing	Imp.
30+30	ICG R.R.	20	13.3	2920	N.A.	-12.5	N.A.
46+20	Conception St.	50	8.9	3200	N.A.	-12.1	N.A.
102+60[1]	Stone St.	40	5.8	655	1690	- 6.2	- 6.2
121+40[1]	St. Stephens Rd.	36	7.0	605	1660	- 4.4	- 4.4
162+70[1]	Stanton Rd.	60	10.5	1076	1325	- 1.5	- 1.5
228+00[1]	Fillingim St.	36	21.2	854	1200	7.2	7.2
234+50[1]	Mobile St.	50	20.9	831	1090	10.6	10.6
251+80[1]	ICG R.R.	18	26.8	1164	1867	13.5	11.4
276+70[1]	ICG R.R.	30	31.5	765	1497	19.0	18.4
308+50	Service Rd.	50	40.1	765	765	29.1	29.1
309+80	I-65	140	40.6	765	765	29.6	29.6
311+80	Service Rd.	50	40.8	765	765	29.8	29.8
330+00	Moffat Rd.	60	48.5	1073	1073	34.8	34.8
330+90	Moffat Rd.	60	48.5	1073	1073	34.8	34.8
333+30[1]	ICG R.R.	18	48.8	2360	2360	35.5	35.5
380+50	ICG R.R.	15	58.7	1985	N.A.	41.0	N.A.
417+30	ICG R.R.	15	74.9	4845	N.A.	46.2	N.A.
434+40	Ziegler Blvd.	86	74.5	588	N.A.	67.5	N.A.

[1] See Chart Nos. 22 and 23 of Appendix C.

provide a construction area clear of these and other utilities. Houses and businesses to be removed are shown on Chart Nos. 14 and 15 of Appendix C.

LANDSCAPING

Landscaping for the project includes grassing on the slopes and berms of the improved channel and a green belt of native grass and special trees or shrubs within the project right-of-way. Grassing of channel slopes will serve the dual purposes of erosion control and beautification. Seeding and plant mulching specifications will depend on soil type, shade conditions, and adaptability for the Mobile climate. The selected plants will be of the native variety for the most part, with some special groups used for accent in a few locations. A detailed planting plan will be developed when advanced design studies for the project are approved.

DISPOSAL OF EXCAVATED MATERIAL

All excavated material will be hauled from the construction area for disposal at designated areas because of existing development within the flood plain. Three possible disposal sites within a reasonable haul distance of the project were investigated. Two of these sites were found to be environmentally acceptable and one was found to be a valued wetland area. The latter was dropped from further consideration.

The two remaining areas are located at each end of the construction area. The site at the lower end of the project is 50 acres adjacent to an area previously used for a sanitary land fill. Construction excavation to be dumped is of good quality which would environmentally enhance this area. The upper site is located about 1,400 feet east of Interstate 65 and north of Threemile Creek between two of the Illinois Central Gulf railroad lines. It consists of 86

acres of upland type terrain out of the flood plain. All disposal areas will be properly graded for drainage and grassed to control erosion.

HYDROLOGIC CONSIDERATIONS

Using the established hydrologic model discharge frequency relationships were developed for the comprehensive plan with the current level of watershed development and with the level of development projected for the year 2030. The discharges produced for these two conditions with the comprehensive plan are shown in Table 12. Stage-discharge, stage-frequency, and discharge-frequency curves were also developed at predetermined locations in the watershed for the comprehensive plan under these two conditions. The stage-frequency curves for this plan are shown on Chart Nos. 24 through 27 of Appendix C and drainage area vs. discharge curves for this plan are shown on Chart No. 28 of Appendix C.

TABLE 12

Peak Discharges for Project Channel

			Peak Discharge in cfs							
HEC-1	HEC-2 [1]	D.A. mi²	2-Yr	5-Yr	10-Yr	25-Yr	50- Yr	100-Yr [2]	SPF [2]	PMF [2]
			Present Urbanization							
2016	0.1	29.09	5850	9080	10400	12500	14100	16000	27500	58500
2015	46.2	27.11	5680	8820	10100	12100	13600	15400	26200	55000
2014	57.9	25.55	4720	7360	8450	10200	11400	12900	22100	46400
2013	123.4	20.98	5300	8170	9220	11100	12500	13600	20800	42200
2012	162.7	19.18	4850	7480	8490	10200	11300	12600	19100	39700
2011	202.0	18.26	4680	7280	8230	9810	10900	12000	18400	38100
2010	233.3	16.37	4020	6210	7050	8390	9340	10300	15800	31700
2009	276.6	15.56	3870	5990	6790	8110	9090	10000	14700	27700
2008	300.5	14.47	3470	5420	6140	7340	8270	9440	14600	23900
2007	315.3	14.37	3300	5080	5760	6820	7680	8740	13360	20500
2006	380.5	10.83	3160	4800	5470	6610	7440	8440	13700	28500
1005	451.5	9.86	3040	4530	5120	6170	6910	7880	12600	26900

TABLE 12 (Cont'd)

Peak Discharges for Project Channel

			Peak Discharge in cfs							
HEC-1	HEC-2 [1]	D.A. mi²	2-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr [2]	SPF [2]	PMF [2]
			Future Urbanization							
2016	0.1	29.09	6020	9450	10900	13000	14600	16700	28200	62800
2015	46.2	27.11	5880	9230	10600	12600	14200	16100	26800	59600
2014	57.9	25.55	4910	7790	8930	10700	12000	13600	22700	50700
2013	123.4	20.98	5730	8500	9500	11300	12600	14300	21400	47100
2012	162.7	19.18	5290	7850	8850	10500	11800	13300	19800	45000
2011	202.0	18.26	5140	7630	8580	10200	11500	12900	19100	43400
2010	233.3	16.37	4450	6630	7510	8960	10100	11300	16800	37100
2009	276.6	15.56	4260	6430	7270	8720	9780	11200	15700	32600
2008	300.5	14.47	3870	5940	6740	8060	9070	10400	15700	28600
2007	315.3	14.37	3450	5300	5960	7150	8010	9140	14400	23500
2006	380.5	10.83	3310	5010	5670	6800	7640	8710	14000	32900
1005	451.5	9.86	3180	4740	5370	6480	7260	8310	13100	31400

[1] Discharge-frequency, stage-frequency, and stage-damage plotted at damage centers at stationing of 97.2, 121.4, 152.2, 204.0, 244.7, 291.5, and 358.0.

[2] Splits occur at Interstate 65.

HYDRAULIC CONSIDERATIONS

The hydraulic analysis of natural conditions was explained earlier in the section titled "Assessment of Problems and Needs." Following the same procedures used for defining natural conditions, backwater profiles, with the comprehensive plan annotated were computed for the current level of urban development and for 2030 development using an "n" value ranging from 0.028 to 0.032 for the channel and 0.080 to 0.180 for overbank areas. The with project channel has the capacity to pass the 25-year frequency discharge within banks. However, the 100-year frequency flood stage with the project installed will be substantially reduced. The effects on flood stage for the 100-year flood with the project installed under the current level of urban development are shown below for the various reaches.

100-Year Flood (Elev. NGVD)

Reach	Without Project	With Project	Modified Freq.
1	7.8	7.4	50
2	11.2	9.0	5
3	14.7	11.4	3
4	19.0	15.9	2
5	27.2	24.4	5
6	36.3	33.3	5
7	52.1	48.5	2

Water surface profile for the 2-, 5-, 10-, 25-, 50-, and 100-year frequencies, standard project and probable maximum floods were computed with the project installed and are shown on Chart No. 29 of Appendix C.

FOUNDATION AND MATERIALS

Threemile Creek is located in the Gulf Coastal Plains physiographic province and is underlain by recent age alluvial and terrace deposits typical of the coastal lowland. Along the streambanks and flood plain, soil near the surface consists generally of silts and clays to depths of 15 to 20 feet. Sands and stiff clays underlie these soft materials. No rock is expected to be encountered within the project limits. Borings have not been made to collect samples for detailed analysis; however, during continued planning and engineering studies, thorough subsurface investigations will be made to insure adequate design for slope stability. In addition, detailed sediment transport studies will be conducted to verify the location of drop structures and determine if additional erosion control measures are needed.

NONSTRUCTURAL

Channel modification as described for the comprehensive plan provided substantial reductions in all reaches except reach 1. This is due primarily to flatter slopes in this reach and the tidal influence from Mobile Bay. Additionally, streambanks are very low in this area which contains some wetlands. Therefore, evacuation of structures in reach 1 is appropriate.

The nonstructural feature of the comprehensive plan provides for evacuation of residential and commercial structures from the flood hazard. Structures chosen for evacuation were identified by ground and first floor elevations and the depth of inundation by various floods. A target level equal to the 25-year flood was chosen, and structures situated at or below this elevation were selected for removal. The first floor level of some of these structures are at elevations well above the 25-year flood due to land acquisitions policies. This requirement adds considerably to the actual protection level provided. In this portion of the flood plain, a small elevation difference can mean a great difference in the frequency of the flooding. Acquisition policy avoids leaving some homes isolated because of a small elevation difference when adjacent homes would be removed. Contiguous groups of structures were selected for removal in order to avoid disruptive social consequences, to the maximum extent practicable. Most of the people involved with the 68 houses and 5 businesses have expressed a willingness to move out. About 13 acres of land will be acquired in the evacuation of these structures. Both residential and business owners to be evacuated from the channel right-of-way and nonstructural area will be protected under the provisions of Public Law 91-646, of the Uniform Relocation and Land Acquisition Policy Act. The area where nonstructural measures will be accomplished is shown on Plate No. 8.

RECREATIONAL DEVELOPMENT

The 320-acre Langan Municipal Park, a proposed 300-acre municipal park, and nine small community parks ranging in size from 2 to 20 acres are located within the Threemile Creek Study area. Three of the community parks border Threemile Creek. These existing parks provide total facilities as follows:

Trails (bicycling and pedestrian)	-	2 miles
Picnicking	-	37 tables
Baseball	-	9 fields
Softball	-	9 fields
Football	-	6 fields
Basketball	-	4 courts
Tennis	-	16 courts

Other facilities such as swimming pools, community buildings, recreation buildings, play equipment, speciality items, etc., are available, but do not influence this study and are therefore not included in above list. Because these parks exist in the study area, justification for including a large inventory of recreational facilities in the Threemile Creek Flood Control Project is limited. However, the City of Mobile has identified the need for an additional park on the south side of the creek between Fillingim Street and Josephine Street. This park primarily will serve the residents of the Crichton area and is now needed since public use of the existing Bush Park is limited to the Kiwanis Boys Club due to an outgrant. Facility needs for this additional park include a baseball field, a paved multi-use court, 12 picnic tables, and a drinking fountain. Land needs of about 3 acres for the park will be acquired by the City since its location is outside the project acquisition limits.

The current major recreation deficiency is the lack of pedestrian and bicycling trails. This is a type of use which can be made of the project rights-of-way. A combined bicycle and pedestrian trail system can be developed to include an 8-foot wide, two-way, paved bicycle path separated from a 4-foot

wide pedestrian path by a grassed or landscaped median. This combined trail will meander along the creek, where space is available. Creek crossings will be kept to a minimum by occurring at street crossings. The addition of land forms, mounds, and landscape plantings will be used to enhance the visual appearance of the trail system. At intervals, rest stops with picnic tables, a bicycle rack, and a drinking fountain will be provided. These rest stops will be accessible by vehicle and parking provided so that rest stops can serve as starting points for the trails. Initial development of the Threemile Creek trail system will extend from Interstate Highway 65 to the lower end of the flood control project. The trail system and new Crichton area park would consist of adding the following facilities.

Picnic Tables	-	12 each
Baseball Field	-	1 each
Bicycle Trail	-	5 miles
Pedestrian Trail	-	5 miles
Multiple Use Court	-	1 each
Bicycle Racks	-	7 each
Waterborne Toilet	-	1 each
Drinking Fountain	-	4 each
Parking Area	-	889 sq. yds.

In its ultimate development, the trail system could connect Municipal Park, the three small parks which border Threemile Creek, and the park proposed herein for the Crichton area. To achieve this, a 50-foot wide easement 1-1/4 miles long would be necessary along the creek to allow the extension of the trail from the upstream portion of the flood control project to Municipal Park. Also, the crossing of Interstate Highway 65 would have to be considered. The future terminus of this trail would be at a future 300-acre park being considered by the City at the mouth of the creek. A thorough consideration of a trail system such as this would include additional trails to connect some of the other 9 community parks in the project area. The recreation facilities to be developed at the time the comprehensive flood damage reduction plan is installed will at least assist the city in meeting a part of their overall park and recreation needs. Location of added facilities is shown on Chart 30 of Appendix C.

OPERATION AND MAINTENANCE

Assurances for local cooperation by the City of Mobile are required before the project can be installed. The City must insure maintenance and operation in accordance with Federal regulations. An operation and maintenance manual will be developed as a guide for the City and will include adequate measures to prevent significant impairment of the design capacity of the project due to growth of willows or other undesirable vegetation after construction. However, provisions will be made for the protection and maintenance of grassed areas provided for stability of channel banks and evacuated areas. Periodic inspection and, if necessary, repairs will be made of riprapped areas providing grade, bank, and transition control. In addition, instream excavation will be required on a periodic basis to remove sediments, debris, and trash from the creek.

PLAN ACCOMPLISHMENTS

The recommended plan evolved as a result of iterations through the formulation of possible alternatives. It was found that a combining of alternatives would provide the most comprehensive solution to the problems and needs of the area. The degree of protection to be provided is the maximum justified. However, the nonstructural portion of the comprehensive plan could not be incrementally justified and was dropped from further consideration.

COSTS

Estimates of the costs for each part of the comprehensive plan were derived separately according to their specific purpose. It contains both structural and nonstructural measures for reduction of flood losses and facilities for enhancement of recreation opportunities. Cost estimates are based on an interest rate of 7-5/8 percent, a project life of 50 years, and March 1982 prices. Summary data on project costs are given in Tables 13, 14, and 15, and a detailed cost estimate is given in Appendix C.

TABLE 13

Summary of Cost for Channel Modification

FEDERAL FIRST COST	
Channel	$5,929,900
Contingencies (20%)	1,186,000
Total for Channels	7,115,900
Engineering and Design (8%)	569,300
Supervision and Administration (5%)	355,800
TOTAL FEDERAL FIRST COST	8,041,000
NON-FEDERAL FIRST COST	
Lands and Damages	$2,480,000
Contingencies (20%)	496,000
Acquisition (15%)	372,000
Total for Lands and Damages	3,348,000
Relocations	4,021,000
Contingencies (20%)	804,000
Total for Relocations	4,825,000
TOTAL NON-FEDERAL FIRST COST	8,173,000
TOTAL COST FOR CHANNEL	16,214,000
AVERAGE ANNUAL COST FOR CHANNEL	
FEDERAL ANNUAL COST	
Interest 7-5/8% (0.07625)	613,000
Amortization (0.001985)	16,000
TOTAL FEDERAL ANNUAL COST	629,000
NON-FEDERAL ANNUAL COST	
Interest 7-5/8% (0.07625)	623,000
Amortization (0.001985)	16,000
Operation and Maintenance	10,000
TOTAL NON-FEDERAL ANNUAL COST	649,000
TOTAL AVERAGE ANNUAL COST FOR CHANNEL	1,278,000

TABLE 14

Summary of Estimated Cost for Recreation

FEDERAL FIRST COST	
50% of Basic Facilities	$413,500
NON-FEDERAL COST	
50% of Basic Facilities	413,500
Additional Lands for Baseball Field	14,200
Total Non-Federal Cost	427,700
TOTAL COST FOR RECREATION	841,200

AVERAGE ANNUAL COST FOR RECREATION

FEDERAL ANNUAL COSTS	
Interest 7-5/8% (0.07625)	31,500
Amortization (0.001985)	800
Total Federal Annual Costs	32,300
NON-FEDERAL ANNUAL COST	
Interest 7-5/8% (0.07625)	32,600
Amortization (0.001985)	800
Operation, Maintenance, and Replacement	9,300
Total Non-Federal Annual Cost	42,700
TOTAL AVERAGE ANNUAL COST FOR RECREATION	75,000

TABLE 15

Summary of Cost for Nonstructural

	Financial Cost	Economic Cost
TOTAL NONSTRUCTURAL COST	$3,533,000	$2,159,000
Total Federal Cost 80%	2,826,000	1,727,000
Total Non-Federal Cost 20%	707,000	432,000

AVERAGE ANNUAL COSTS FOR NONSTRUCTURAL

FEDERAL ANNUAL COST	
Interest 7-5/8% (0.07625)	$131,700
Amortization (0.001985)	3,400
Total Federal Annual Cost	135,100
NON-FEDERAL ANNUAL COST	
Interest 7-5/8% (0.07625)	32,900
Amortization (0.001985)	900
Maintenance of Grassed Areas	1,000
Total Non-Federal Annual Cost	34,800
TOTAL AVERAGE ANNUAL COST FOR NONSTRUCTURAL	169,900

BENEFITS

Benefits for the comprehensive plan are primarily attributed to the reduction in flood damages. Based on 1981 price levels and development, the damage reduction benefit is reduced to an average annual equivalent value in order to determine the expected benefits over the economic life of the project. Expressing benefits in manner facilitates their comparison with the average annual costs of a project, as shown previously. The benefit-to-cost ratio indicates the expected return per dollar expended in the form of reduced costs to the nation's economy for flood damage repairs and assistance. In addition to the reduction of economic losses which accrue to the plan, intangible benefits for reduction in the threat to human life and health may result. Intangibles have not been quantified for this report. Information supporting the derivation of project benefits is shown in Appendix B.

The Problems and Needs section of this report described the computation of the average annual damages from Threemile Creek under existing, or "without project" conditions. This is the baseline against which all of the plans considered were compared during the plan formulation process. Tradeoffs made in this process led to the development of a comprehensive plan consisting of channel modification and flood plain evacuation. This combination of structural and nonstructural measures provides a high degree of protection for all reaches of the stream.

Table 16 shows expected annual damage reductions for the plan. The total damage reductions in each damage category for the plan are shown in Table 17. The plan eliminates just over 95 percent of the total expected annual damages. Most of this reduction is provided by the channel modification, which accrues $1,748,100 on an average annual basis. Evacuation of structures in Reach 1 reduces the annual damages another $17,200 with $12,800 of this assigned to residential property.

TABLE 16

Total Average Annual Damage Reduction[1] in $1,000
By Reach

Reach	Comprehensive Plan Damages Existing	Damages With Plan	Gross Flood Damage Reduction
1	22.0	0.1	21.9
2	290.3	21.2	269.2
3	490.5	13.6	476.9
4	179.3	1.8	177.5
5	157.2	9.1	148.1
6	660.3	41.4	618.9
7	53.4	0.7	52.8
TOTAL	1,853.1	87.8	1,765.3

TABLE 17

Total Average Annual Damages Reduction [1] in $1,000
By Category

Category	Damages Existing	Damages With Plan	Damage Reduction
Residential Structure	616.5	26.2	590.3
Residential Contents	420.2	15.0	405.2
Commercial	600.5	36.2	564.3
Public	2.3	0.1	2.2
Industrial	0.7	0	0.7
Transportation	43.4	2.3	41.0
Commercial Utilities	62.3	3.0	59.4
Emergency	106.7	5.0	101.6
TOTAL	1,853.1	87.8	1,765.3

(1) Internalized damage adjustments not included.

Table 18 shows the damage reductions for residential and commercial categories, by reach under existing and with project conditions. These data indicate the beneficial effect of the plan which reduces residential damages by 96 percent, and commercial damages by 94 percent.

TABLE 18

Average Annual Damage Reductions in $1,000
Commercial and Residential Property Only

	Residential Property			Commercial Property		
	Damages			Damages		
Reach	Existing	With Plan	Reduction	Existing	With Plan	Reduction
1	16.7	0.1	15.6	2.9	0	2.9
2	243.3	18.1	225.2	12.9	0.7	12.2
3	434.8	12.1	422.7	2.0	0	2.0
4	158.7	1.6	157.2	0.9	0	0.9
5	91.9	6.9	85.1	48.1	1.3	46.8
6	44.0	1.9	42.0	533.5	34.3	499.2
7	47.3	0.6	46.7	0.3	0	0.3
TOTAL	1,036.7	41.2	995.5	600.5	36.3	564.2

The final category of flood control benefits considered for the Threemile Creek project is the effect of rising affluence over time. The theory is that additional household contents will be added over time as per capita income increases. Current Federal guidelines limit the projected value of residential contents to 75 percent of the structure value. The OBERS rate of per capita income growth for the study area is used in estimating the total value. This growth factor produces a value of 50 percent above the baseline value established for contents under existing conditions.

Once the 50 percent increase in damage is reached (corresponding to the point in time where contents have grown from 50 to 75 percent of structure value) no

further growth is allowed. This process of evaluation was applied to both existing and with project conditions. The average annual equivalent damages over the period 1982-2032 were then computed under both conditions. The difference between the with and without project average annual equivalent damages for contents is the benefit assigned for the affluence factor. This benefit is $113,200 for the NED plan and $114,600 for the Comprehensive plan as shown in Table 19.

TABLE 19

Affluence Effect Benefits ($1,000)

Year	Per Capita Income1/	W/O Proj AAD	W/NED Plan AAD	NED Plan Reduction	W/Compr. Plan AAD	Compr. Plan Reduction
1980	$ 3,577					
1982	3,808	420.2	19.7	400.5	15.0	405.2
1990	4,732	522.1	24.5	497.6	18.6	503.5
1996	5,712	630.2	29.6	600.6	22.4	607.8
2000	6,450	630.3	29.6	600.7	22.5	607.8
2010	8,690	630.3	29.6	600.7	22.5	607.8
2020	11,054	630.3	29.6	600.7	22.5	607.8
2030	N/C	630.3	29.6	600.7	22.5	607.8
2032	N/C	630.3	29.6	600.7	22.5	607.8
Avg. Annual Equivalent (50-yr)		539.0	25.3	513.7	19.2	519.8
Less: Existing AAD		420.2	19.7	400.5	15.0	405.2
Avg. Annual Equiv. Affluence Effect		118.8	5.6	113.2	4.2	114.6
Affluence Benefit				113.2		114.6

1/ OBERS Series E Projections, Mobile SMSA, 1967 dollars.
N/C = Not computed

A total of 68 structures have been identified for removal under the nonstructural portion of the comprehensive plan. In order to account for the internalized risk of the flood plain occupants, certain adjustments were made to the damage reductions. These adjustments include subtraction of flood insurance premiums and deductibles and the addition of flood insurance policy

overhead and reduction in emergency services, savings with evacuation of occupants. Since six of the houses to be removed are actually situated above the 100-year flood elevation, no flood insurance premiums, deductibles or flood insurance policy overhead were assigned to these structures. Flood damages in reach 1 after channel modifications are installed equals $17,200. Removal of the 68 structures within the 100-year flood plain and 6 structures outside 100-year flood plain would reduce those remaining damages to $100.

The most significant adjustment is for flood insurance premiums for both structures and contents, which averages $195 per house. Average annual deductibles were computed for each house ($500 each for structure and contents per flood event) based on its elevation and flood frequency. Insurance overhead of $39 per house was also assigned for evacuation. Reductions in flood related emergency services is only $300 per year for the removal of these structures.

Total flood damage reduction benefits accruing to the comprehensive plan amount to $1,869,500 as shown in Table 20. This estimate includes inundation reduction, affluence effect benefits, and other adjustments appropriate for nonstructural measures.

TABLE 20

Summary of Benefits

Flood Damage Reduction Benefits for Channel Works		$1,748,200
Gross Flood Damage Reduction for Evacuation		17,100
Gross Damage Reduction Benefits		1,765,300
Less:	Flood Insurance Premiums for Evacuation	(-)10,400
	Flood Insurance Deductibles for Evacuation	(-) 3,000
Plus:	Flood Insurance Overhead for Evacuation	2,700
	Emergency Service Reduction for Evacuation	300
Affluence Factor Benefits for Channel Works		113,200
Affluence Factor Benefits for Evacuation		1,400
Total Flood Control Benefits, Comprehensive Plan		$1,869,500

RECREATION

The benefits assigned to recreation are based on the needs met by the added facilities. Visitor day values are based on the characteristics of the recreation experience. Five general characteristics were analyzed:

- o The number and type of activity.
- o The available recreation opportunities in the study area.
- o The carrying capacity of the facilities.
- o The accessibility of the recreation facilities to the public.
- o The aesthetic quality of the facilities.

Visitor-day values range from $3.40 to $3.70; however, a value of $3.49 was used for estimating recreation benefits. Visitor occasions for each facility were estimated and converted to visitor days with a factor of 2, which indicates that more than one activity would be pursued to each visitor. The computations of project benefits are shown below.

Facility	Visitor Occasions
Picnic tables	7,200
Baseball field	6,000
Trail, bicycle	25,000
Multiple-use court	5,000
Trail, pedestrian	25,000
TOTAL	68,200

Visitor Days = 68,200 ÷ 2 = 34,100
Initial Benefits = 34,100 x $3.49 = 119,000

Additional information of development of recreation needs and facilities is provided in Appendix B.

PROJECT ECONOMICS

Total project benefits accruing from flood damage reduction, affluence, and recreation are estimated to be $1,987,100 and $1,980,400 for the Comprehensive and NED plans. These estimates are based on a project life of 50 years, interest rate at 7-5/8 percent and development prices as of October 1981. Each feature of the comprehensive plan was apprised separately to define its economic impact on the overall project. Benefits, costs, and B/C ratios are shown below.

Feature	Benefits ($1,000)	Costs ($1,000)	Net Benefits ($1,000)	B/C Ratios
Structural Measures	$1,861.4	$1,278.0	$583.4	1.46
Nonstructural Measures	6.7	169.0	-162.3	0.04
Recreation Features	119.0	75.0	44.0	1.59
Structural plus Nonstructural	1,869.5	1,447.0	422.5	1.29
* Structural plus Recreation (NED)	1,980.4	1,353.0	627.4	1.46
Comprehensive Plan	1,987.1	1,522.0	465.1	1.30

* NED Plan

RECOMMENDED NED PLAN

The formulation of a plan which would best meet the basic objective of National Economic Development (NED), followed a logical sequence of evaluations. The comprehensive plan would best meet the basic objective of providing the maximum degree of flood damage reduction justified as a total project. The comprehensive plan is desired by local interest and the residents of the flood plain, but current Federal guidelines give preference to the NED plan. Although the structural, plus nonstructural, combination shows positive net benefits, the nonstructural feature is not incrementally justified with economic and environmental benefits. Therefore, the plan which includes channel modification and recreation provides the maximum net benefits above costs and is, by definition, the NED plan for Threemile Creek which is recommended for Corps development.

PROJECT IMPACTS

Economic impacts have been partially defined in the previous sections which indicate that the project is well justified. However, estimation of benefits for construction wages, sales associated with maintenance of construction vehicles, and materials such as steel, riprap, asphalt, seeds, plants, and building supplies has not been attempted. Such impacts would be realized and welcomed by the construction industry.

Urban development has encroached on Threemile Creek within the project reach and water quality has declined until little habitat remains for fish and wildlife. The removal of buildings from the flood plain and the conversion of these riparian areas back to green space would provide potentially better habitat for squirrels, song birds, and other urban wildlife and enhance visual appeal and recreational values along the creek.

The major impacts would be those associated with construction and the relocation of people. Noise levels would rise and fugitive dust could be a minor problem associated with the hauling of the excavated material through urban areas. However, the completed project should act as a noise and air pollution absorber; thereby, reducing noise levels and improving air quality in the immediate vicinity of the creek.

Relocation of families always involves some trauma, but escape from the present flood hazard is viewed as an improvement in the quality of life by most of the affected people.

A cultural resources reconnaissance and data search found a long history of human habitation along the creek. Although Mobile has many standing structures well over 100 years old, none are within the immediate project area. The data search found 17 structures dating from 1900 to 1920 near the existing flood fringe and a raised cottage (ca. 1850) just outside the 100-year flood plain.

Archaeological investigations found a presence of early Indian habitation and, various documents show that exploration of the area was performed by the Spanish and French as early as the 1500's. The French were the first to settle Mobile in its present location in 1711, where it has remained since that time. Although, no significant archaeological finds were made during the reconnaissance, it is possible that excavation during project construction could discover traces of the early inhabitants. Therefore, a more thorough investigation will be conducted during continued planning and engineering. Information concerning the cultural resources survey along Threemile Creek is given in Appendix D. A summary of impacts on resources of national recognition is given in Table 21, and compliance check against designated environmental statutes is given in Table 22. Environmental impacts are addressed in detail in the Environmental Impact Statement, and in Appendix D. Significant EQ effects for the recommended plan are shown in Table 23.

Evaluation of the Standard Project flood with and without project conditions would reduce the damaging effects of these events. The project would reduce the level of the SPF by as much as 4 feet while still maintaining acceptable velocities. Damages which could be expected from the SPF "without project" are $32,370,000; however, "with project" damages would be only $16,780,000. Profiles for these two conditions and other flood frequencies are given in Appendix C. Single event damages are shown in Table B-14.

TABLE 21

Effects of the Recommended Plan on Resources of Principal National Recognition

Types of Resources	Principal Sources of National Recognition	Measurement of Effects
Air Quality	Clean Air Act, as amended (42 U.S.C. 1857h-7 et seq.)	Slight decline during construction due to exhaust emissions and fugitive dust. Slight long-term improvement due to increased vegetation.
Areas of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	5.2 acres of tidal, fresh water swamp would be lost.
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)	No effect.
Fish and wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. Sec. 661 et seq.)	5.2 acres of swamp, 39.7 acres of bottomland forest, 3.6 acres of upland forest, and 3 acres of grassland would be disturbed during construction. Approximately 22 acres of developed area would be converted to vegetated land. Approximately 8 acres would be paved for recreation within the 122-acre project lands.
Flood plains	Executive Order 11988, Flood Plain Management	Approximately 22 acres of developed land would be returned to vegetated flood plain.
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. Sec. 470 et seq.)	None known in the planning area but sites may be uncovered during construction.
Prime and unique farmland	CEQ Memorandum of August 1, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act.	Not present in the planning area.
Water Quality	Clean Water Act of 1977 (33 U.S.C. 1251 et seq.)	No effect.
Wetlands	Executive Order 11990, Protection of Wetlands Clean Water Act of 1977 (42 U.S.C. 1857h-7, et seq.)	Approximately 5.2 acres of wetland would be altered to open water.
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.)	Not present in planning area.

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TABLE 22

Compliance Check for the Recommended Plan
With Designated Environmental Statutes

Federal Policies	Compliance
Archaeological and Historic Preservation Act	FC
Clean Air Act, as amended	FC
Clean Water Act	FC
Coastal Zone Management Act	FC
Endangered Species Act	FC
Estuary Protection Act	FC
Federal Water Project Recreation Act	FC
Fish and Wildlife Coordination Act	FC
Land and Water Conservation Fund Act	FC
Marine Protection, Research and Sanctuary Act	NA
National Environmental Policy Act	FC
National Historic Preservation Act	FC
Rivers and Harbors Act	NA
Watershed Protection and Flood Prevention Act	NA
Wild and Scenic Rivers Act	NA

NOTES

FC - Full Compliance - Having met all requirements of the statute for the current stage of planning.

PC - Partial Compliance - Not having met some of the requirements that normally are met in the current stage of planning.

NA - Not Applicable - No requirements of the statute require compliance for the current stage of planning.

TABLE 23

Significant EQ Effects for the Recommended Plan

SIGNIFICANT RESOURCES	EFFECTS ON EQ ATTRIBUTES: ECOLOGICAL	CULTURAL	AESTHETIC	NOTES
1. Land Use	Beneficial	Beneficial	Beneficial	More wildlife habitat, green space, and recreational lands would be created.
2. Community Cohesion	No Effect	Beneficial	No Effect	The community is very stable so any change would be very slight.
3. Community Growth	No Effect	No Effect	No Effect	
4. Housing	Beneficial	Beneficial	Beneficial	Flood prone houses would be replaced by green space and recreational facilities.
5. Employment	No Effect	Beneficial	No Effect	Some long-term benefits would accrue from removing businesses out of the flood zone.
6. Displacement of People	No Effect	Beneficial	No Effect	People would be relocated out of a flood prone area.
7. Public Facilities	No Effect	Beneficial	No Effect	Recreation facilities would be created.
8. Public Services	No Effect	Beneficial	No Effect	Recreational services would be increased.
9. Transportation	Beneficial	Beneficial	Beneficial	Street bridges would be improved. Bicycle and pedestrian paths would be added. The recreation plan would protect the green space.
10. Property Values	No Effect	Beneficial	Beneficial	Flood hazard and flood damage would be reduced.
11. Tax Values	No Effect	Adverse	No Effect	Tax base would be slightly reduced.

READEX FICHE

TABLE 23 (Con:'d)

Significant EQ Effects for the Recommended Plan

SIGNIFICANT RESOURCES	EFFECTS ON EQ ATTRIBUTES ECOLOGICAL	CULTURAL	AESTHETIC	NOTES
12. Noise	Beneficial	Beneficial	Beneficial	Increased green space would reduce noise.
13. Leisure Opportunities	Beneficial	Beneficial	Beneficial	Recreational opportunity would increase and would protect the green space from encroachment in the future.
14. Aesthetics	Beneficial	Beneficial	Beneficial	Reduced flood damage, increased green space, and recreational landscaping.
15. Riparian Environment	Beneficial	Beneficial	Beneficial	Over the long-term, more riparian habitat would remain undeveloped.
16. Endangered and Threatened Species	No Effect	No Effect	No Effect	
17. Air Quality	Beneficial	Beneficial	Beneficial	Less emissions and more green space
18. Water Quality	Beneficial	No Effect	No Effect	Some improvement in aeration.
19. Erosion	Beneficial	Beneficial	Beneficial	Erosion would be reduced.
20. Benthic Community	Beneficial	No Effect	No Effect	A more stable, diverse and abundant substrate would be created.

SENSITIVITY ANALYSIS

During the study process every effort is made to eliminate risks and uncertainties which may occur through assumptions or unknowns. The risks and uncertainties for this study have been minimized as much as possible by concentrating on detail and evaluation of the validity of the data used during the analysis. Current state of the art methodology was used in the determination of the effectiveness of the alternatives. The design of the NED plan was based on the results of hydrologic and hydraulic computer models developed by the Hydraulic Engineering Center, and are considered to be very reliable in determining discharges and backwater effects under natural and improved conditions. However, some assumptions were made concerning the geologic conditions along the creek and the location of the drop structures. As stated earlier, subsurface investigations and sediment transport studies to be conducted during continued planning and engineering will more accurately define the need for slope stabilization.

The purpose of a sensitivity analysis, shown below, is to determine if percentage variations in benefits and costs would produce significant changes in the economics of the NED plan. In the flood damage analysis it is assumed that the reliability of the data and calculations are within a range of accuracy of plus or minus 10 percent and the project costs would be within the same tolerance since a 20 percent contingency is included in the estimates.

Comparison of Variation in Benefits ($1,000)

	Benefits	Cost	B/C Ratio
Estimate for Selected Plan	1,980.4	1,353.0	1.46
- 10%	1,782.0	1,353.0	1.32
+ 10%	2,178.0	1,353.0	1.61

If the benefits are reduced by 10 percent and costs are increased by 10 percent the results would be $1,782.0 ÷ $1,488.0 = 1.20

PLAN COMPLIANCE WITH EO 11988

The executive order provides as its purpose:

> " *** to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of flood plain development wherever there is a practicable alternative *** "

Since the development of a project on Threemile Creek cannot avoid the base flood plain, consideration was given to:

- Reducing the hazard and the risk of flood loss.
- Minimizing the impact of floods on human safety, health, and welfare.
- Restoring and preserving the natural and beneficial flood plain values.

The hazard associated with flooding on Threemile Creek is reduced by providing channel works and flood plain evacuation which will result in significant reduction in flood losses. In addition, the impacts of floods on human safety, health, and welfare will be minimized by removing the threat of frequent flooding which transports polluted and contaminated flood waters into the homes and businesses. With control of severe flooding, the safety of the flood plain occupants will be enhanced through reducing the possibility of injury or death which is usually a threat to children who are unaware of the danger or the elderly who are unable to cope with it.

The comprehensive plan for Threemile Creek has been designed to minimize the environmental impacts on the stream and its flood plain by restoring the natural function of the flood plain. The future environment and aesthetics of the flood plain would be enhanced with removal of structures subject to flooding and creation of a green belt along the stream. Healthy activities will be pursued with provision of various outdoor recreation facilities. Trees and shrubs which would eventually replace the areas occupied by houses and provide habitat and nesting areas for wildlife which can adapt to the urban environment.

DISCUSSION

Throughout the study of Threemile Creek close coordination has been maintained with city planners and engineers. Their knowledge of the problems and the desires of the City to provide a comprehensive flood control plan which would solve the immediate and long-range flood problems provided valuable information in developing a comprehensive flood control plan. Information gathered from flood victims, and State and Federal interests at public meetings, workshops, and other informal meetings also played a major role in the development of the recommended plan.

City officials perceive the comprehensive plan as the solution to a severe problem which has plagued the City for many years, and they recognize that Federal assistance being provided through the Corps, the Department of Housing and Urban Development (HUD) and the Federal Emergency Management Agency is giving them an unusual opportunity to eliminate or substantially reduce flooding problems along the creek. Seizing this opportunity, they have developed plans to broaden the scope of the Corps' plan and proceed in advance of project authorization with accomplishment of some of the items of local cooperation. They have plans for going ahead with bridge modifications and replacements and for purchase of buildings and lands within the channel rights-of-way which would require removal prior to project construction. Between the period 1 January 1982 and September 1982, when this final report was prepared, the City had spent $3,728,000 for property acquisition and relocation of residents within the right-of-way of the recommended project. Plans are currently being prepared for modification of utilities, bridges, and other facilities. In addition, they plan to purchase and remove any structures which would be within the modified 100-year flood plain to provide a very high degree of flood damage reduction. They have recently adopted flood plain and basin development ordinances which will enhance the long-term effects of the project.

The City is very serious about elimination of flood problems along Threemile Creek and the work they are doing at this time in preparation for the Corps' project is in keeping with the recent administrative initiatives for innovative financing. This "upfront" expenditure by the local sponsor will be funded partially from HUD and partially from city revenue and will amount to several million dollars.

In accordance with instructions contained in HR 97-850 (The Energy and Water Development Appropriations Bill of 1983) costs and benefits for local works installed between 1 January 1982 and September 1982 have been asessed. Local works consist of the excavation of 80,000 cubic yards of material from the creek between St. Stephens and Stanton Roads at a cost of $199,100. The decrease in flood stages due to this very limited improvement is insignificant, therefore monetary benefits have not been assigned.

PLAN IMPLEMENTATION

INSTITUTIONAL REQUIREMENTS

Submission of this report constitutes the first step in a series of events which must take place before a Federal project can become a reality. It may be modified at any stage of review, and only if it successfully passes all review stages will it ultimately be constructed. These events are:

- o Approval by the Division Engineer
- o Approval by the Board of Engineers for Rivers and Harbors
- o Approval by Office of the Chief of Engineers
- o Approval of State and other agencies
- o Approval of the Secretary of the Army
- o Approval of the Office of Management and Budget
- o Congressional Authorization

Legal requirements for Federal funding of the NED Plan for Threemile Creek are provided in the Flood Control Acts of 1936 and 1944, as amended. Cost apportionment for the NED plan has been specified, based on these congressional

acts. Other Federal policies for water resources development have been followed in project planning and will be implemented when needed. A formal project agreement with the local sponsor will be developed to assume uniform measures for relocation of residents in the project rights-of-way and to provide annual maintenance of the project features.

NON-FEDERAL RESPONSIBILITIES

The presently estimated non-Federal share of the project first costs for flood control and recreation would be $8,173,000 and $427,700, respectively. In addition, non-Federal interests will be required to operate and maintain the project at an estimated annual cost of $10,000 for the channel works and $9,300 for the recreation features. Other general requirements are set forth under the recommendations provided on pages 83 and 84 of the report. However, in accordance with the Flood Control Act of 1936, first cost for flood control is limited to 50 percent of the total construction cost allocated to flood control, or $8,107,900 as currently estimated.

VIEWS OF NON-FEDERAL INTEREST

On 3 February 1981, the initial public meeting was held in Mobile to provide an opportunity for the expression of views on the flood problems caused by Threemile Creek. Notice of the meeting was furnished to the United States Senators and Congressmen from the area, Federal and County officials and State agencies, City officials, interested organizations, and property owners. Citizens of Mobile expressed a desire for relief from recurring flood losses to their homes and businesses.

At a public workshop held on 17 December 1981, City officials, Federal and State agencies, and other interests reviewed alternatives which evolved during project formulation studies. During the workshop, participants were allowed to indicate their choice of the type of project they would prefer. The

majority of the people preferred channel modification or flood plain evacuation or a combination of both.

On 24 June 1982 a final public meeting was held to present the findings of the study and to explain the comprehensive plan for mitigation of the flooding problems. City officials indorsed the plan and most residents of the area were in general support of the comprehensive plan. Section II of Appendix A shows the public involvement program as it was carried out during this study.

REVIEW BY FEDERAL AND STATE AGENCIES

On 13 May 1982 the draft report and Environmental Impact Statement was circulated among the necessary Federal and State agencies and other interest for their review and comments. In addition, on 15 June 1982, a joint Public Notice with the Corps, the Alabama Water Improvement Commission, and the Alabama Coastal Area Board was issued notifying the public of the Corps' intent, and on 11 June 1982, the Environmental Protection Agency published the Notice of Availability in the Federal Register. Letters from those agencies responding to the report, as well as the Fish and Wildlife Coordination Act Report, are shown in Section III of Appendix A.

CONCLUSIONS

A severe flood problem along Threemile Creek in Mobile, Alabama, causes damage to homes, businesses, hospitals, streets, and public utilities. Floods which occurred in April and May 1980 and May 1981 have caused major financial losses totaling between $35,000,000 and $40,000,000 and created sociological problems for the inhabitants and business owners within the affected area. Although the most complete solution to the flooding problems on the creek would be the comprehensive plan, which would include structural and nonstructural measures, the incremental benefits attributed to the flood plain evacuation portion would only be $6,700 of the total project benefits of $1,980,400 and have a benefit-to-cost ratio of 0.04 to 1. It is, therefore, concluded that the most

practicable plan for reducing flood losses and other related impacts along the stream would consist of 5.6 miles of channel enlargement and the addition of certain recreation facilities to provide for enhancement of recreational opportunities withir the area. The NED Plan is shown on Plate No. 9.

Several alternatives were evaluated in detail and include no action, zoning and building code regulations, flood proofing of individual buildings and single land tracts, permanent evacuation of flood plain areas, reservoirs, channel modifications, stream diversion, and levees. The selected plan was based on an analysis of structural and nonstructural measures using engineering, environmental, social, and economic criteria, and will be performed in accordance with applicable laws and regulations regarding the protection of environmental resources. Methods to minimize adverse environmental effects will be employed as appropriate.

The plan, as presented in this report, has a benefit-to-cost ratio of 1.5 to 1. The project would have average annual benefits and costs of $1,980,400 and $1,353,000, respectively. It will provide complete protection against floods that occur on the average of once every 50 years. This plan will reduce the stage of the 100-year frequency flood significantly, down to about the 5-year frequency flood under natural conditions. The total first cost for the plan is $17,055,200 of which $8,454,500 is Federal and $8,600,700 non-Federal. However, the 1936 Flood Control Act limits the non-Federal cost for the project to not more than 50 percent of the cost of the flood control features. The City of Mobile has expressed a desire for the work and has indicated a willingness and ability to meet the requirements of local cooperation. A letter of intent to cooperate, including a draft Sec. 221 Agreement, is provided in Appendix A. Letters from those agencies responding to the draft environmental impact statement are shown in the EIS.

The Fish and Wildlife Service Coordination Act Report included four comments on the plan presented in this report. Three of the areas of concern were addressed in the report and one will be considered during continued Planning and Engineering Studies.

RECOMMENDATIONS

I recommend that the NED Plan for flood damage reduction on Threemile Creek, Mobile, Alabama, consisting of enlarging 5.6 miles of channel, modification or replacement of bridges, utility lines and other flow impediments; and, providing recreational facilities be authorized for construction. This recommendation is made in recognition of current administrative initiatives before Congress on specific policies for Federal participation in water resources development. While specific policies applicable for the Threemile Creek project have not yet been established, non-Federal interests can expect that, under the Administrations' financing and cost-sharing principles, the level of their financial participation will need to be significantly greater than in the past. Therefore, my recommendation for construction authorization of the Threemile Creek Project is made subject to cost-sharing and financing arrangements with the responsible non-Federal agencies sponsoring the project which are satisfactory to the President and the Congress. In addition to the general requirements of law for this type of project, local interest must agree to comply with the following requirements.

1. Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction and maintenance of the project, including suitable areas determined by the Chief of Engineers for initial and subsequent disposal of excavated material, and necessary retaining dikes, or the costs of such retaining works;

2. Accomplish without cost to the United States all alterations and relocations of buildings, transportation facilities, storm drains, utilities and other structures and improvements necessary for the project;

3. Fulfill the requirements as specified by the provisions of the Uniform Relocation Assistance and Real Estate Property Acquisition Policy Act of 1970 (PL 91-646) approved 2 January 1971;

4. Provide a cash contribution equal to 50 percent of the first costs allocated to basic recreation facilities. Provide other recreation land and facilities included in the recommended plan.

5. Maintain and operate the project after completion without cost to the United States in accordance with regulations prescribed by the Secretary of the Army; and,

6. Hold and save the United States free from damages due to the construction and operation and maintenance of the project, except where such damages are due to the fault or negligence of the United States or its contractors.

PATRICK J. KELLY
Colonel, CE
District Engineer

[First endorsement]

SADPD-P (24 Sep 82)
SUBJECT: Interim Survey Report and Environmental Impact Statement on Threemile Creek, Mobile, Alabama - 12128a

DA, South Atlantic Division, Corps of Engineers, 510 Title Building, 30 Pryor Street, S.W., Atlanta, Georgia 30303 31 January 1983

TO: Resident Member, Board of Engineers for Rivers and Harbors, Kingman Building, Fort Belvoir, Virginia 22060

I concur in the recommendations of the District Engineer.

FORREST T. GAY, III
Brigadier General, USA
Commanding

APPENDIX A

SECTION I – LOCAL COOPERATION

SECTION II – PUBLIC INVOLVEMENT

SECTION III – COORDINATION

APPENDIX A

This appendix consists of three sections. Section I contains the study authorization, resolutions and other pertinent correspondence between the Corps and the local sponsor. Section II is a summary of public involvement activities undertaken during the study, and Section III contains letters received during the Coordination phase of the study.

APPENDIX A

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SECTION I – LOCAL COOPERATION

SECTION 1

Study Authority, Congressional Resolution

RESOLUTION

Resolved by the Committee on Public Works of the House of Representatives, Untied States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on Mobile Harbor, Alabama, published as House Document Numbered 74, 83d Congress, 1st Session, and the report on the Alabama Coast published as House Document Numbered 108, 90th Congress, 1st Session and other pertinent reports, with the view to determining if any modifications of the recommendations contained therein are advisable at the present time with particular reference to providing a plan for development, conservation, and utilization of water and related land resources in the Mobile River from its head, 45 miles above Government Street in Mobile, Alabama, to its mouth in the Gulf of Mexico, including the Mobile Metropolitan area; Mobile Delta area, Mobile Bay; and other streams contained in Mobile and Baldwin Counties, Alabama, adjacent coastal areas and offshore coastal lands. Such study shall include appropriate consideration of the needs for protection against floods and wise use of flood plains lands in the coastal tributaries, bank and channel stabilization in the coastal tributaries, restoration, and protection of natural lake and estuarine areas, navigation facilities, regional water supply and waste management facilities systems, general recreational facilities, enhancement and control of water quality, enhancement and conservation of fish and wildlife, and other measures for environmental enhancement, economic, and human resources development, and shall be harmonious components of comprehensive development plans formulated by various planning agencies and interested Federal agencies.

Adopted: October 12, 1972

(Signed) JOHN A. BLATNIK

Attest: _____
John A. Blatnik, M.C.
Chairman

Requested by: Hon. Jack Edwards

RESOLUTION

Resolved by the Committee on Public Works of the House of Representatives, United States, that the Board of Engineers for Rivers and Harbors is hereby requested to review the reports of the Chief of Engineers on the Tennessee-Tombigbee Waterway, published as House Document 486, Seventy-Ninth Congress, 2nd Session and other pertinent reports on the Waterway which describe the project, with a view to determining whether any modifications of the recommendations contained therein are advisable at the present time, with particular reference to providing an integral portion of a plan to be developed by state, regional and local entities, coordinated among the states containing the counties named below, particularly in the related areas of development, utilization and conservation of water and related land resources of the connecting river basins and their environs with due consideration for water related land resources planning and management activities in the 18 county area consisting of McNairy, Hardin, and Wayne Counties in Tennessee, Tishomingo, Prentiss, Itawamba, Monroe, Clay, Lowndes, Noxubee Counties of Mississippi and Pickens, Greene, Sumter, Marengo, Choctaw, Clarke, Washington, and Mobile Counties of Alabama and adjacent tributary areas. Such study or studies to include appropriate consideration of the needs for protection against floods, wise use of flood plain lands, navigation facilities, regional water supply and waste management facilities systems, general recreational facilities, enhancement and control water quality, enhancement and conservation of fish and wildlife, and other measures for environmental enhancement, economic and human resource development as well as any other appropriate studies, and shall be harmonious and integral components of an overall comprehensive plan formulated by various planning agencies and interested Federal agencies and coordinated among the above named states and their subdivisions by the Tennessee-Tombigbee Waterway Development Authority which is the designated planning coordinator for these studies as they relate to the Tennessee-Tombigbee Waterway.

Adopted: April 11, 1974

(Signed) JOHN A. BLATNIK

Attest: _____
John A. Blatnik, M.C.
Chairman

Requested by: Hon. Robert E. Jones; Hon. Jamie L. Whitten; Hon. David R. Bowen; Hon. Tom Bevill; Hon. Jack Edwards; Hon. Walter Flowers; Hon. John Buchanan.

CITY OF MOBILE

MOBILE, ALABAMA

COMMISSIONERS
GARY A. GREENOUGH
ROBERT C. DOYLE JR.
LAMBERT C. MIMS

PLEASE ADDRESS REPLY TO: Post Office Box 2214
Mobile, AL 36652

Colonel Robert H. Ryan
District Engineer
Corps of Engineers-U.S. Army District
Post Office Box 2288
Mobile, Alabama 36628

Dear Colonel Ryan:

In response to your request, I have reviewed the requirements of Section 221, Public Law 91-611. I certify that the City of Mobile, Alabama, has the constitutional and statutory authority required by said Section 221 to enter into a contract between the City and the United States of America for local cooperation in the proposed Three Mile Creek Flood Damage Reduction Project. Additionally, I conclude that the City of Mobile would be acting within such authority in executing a contract similar to the sample contract which appears at page A-I-7 of the Interim Survey Report and Environmental Impact Statement for Three Mile Creek dated May, 1982.

I am the Chief Legal Office of the City of Mobile, Alabama.

Sincerely yours,

Roderick P. Stout
City Attorney

RPS:kg

Enc.

cc: Mayor Gary Greenough
Commissioner Lambert Mims
Commissioner Robert C. Doyle
Tom Peavy, City Engineer
Gordon Blackwell

R E S O L U T I O N

WHEREAS, it is understood that a flood damage reduction plan is being considered by the U. S. Army Corps of Engineers, Mobile District along Three Mile Creek within the City of Mobile, Alabama; and,

WHEREAS, the project would provide for channel modification and recreation facilities. Channel modification would consist of deepening and widening a 5.6 mile-long reach of the creek which will require the removal of 42 houses and 2 businesses and the modification or replacement of some bridges and utilities. Recreation facilities would consist of those compatible with flood plain use; and,

WHEREAS, it is further understood that the City of Mobile will be required to enter into an agreement with the United States of America in accordance with Section 221 of Public Law 91-611 if the project is authorized by the Congress; and,

WHEREAS, in addition to the foregoing, it is also understood that the City of Mobile assumes no financial obligation at this time and that such an obligation will only be created at such time as the City approves and enters into agreement referred to hereinabove.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA that the City of Mobile expresses its intent to cooperate with the Corps of Engineers in the flood damage reduction project on Three Mile Creek; however, the City continues to reserve the right to review and participate in plan development to insure that the legal and fiscal capabilities of the City are adequate when final obligations for implementation of the plan are required.

Adopted: AUG 31 1982

Richard L. Smith
City Clerk

SAMPLE

AGREEMENT BETWEEN
THE UNITED STATES OF AMERICA
AND
THE CITY OF MOBILE, ALABAMA
FOR LOCAL COOPERATION AT
THREEMILE CREEK, MOBILE, ALABAMA

THIS AGREEMENT entered into this _____ day of _____, 198___ by and between the UNITED STATES OF AMERICA (hereinafter called the "Government", represented by the Contracting Officer executing this Agreement, and the CITY OF MOBILE (hereinafter called the "City").

WITNESSETH THAT:

WHEREAS, construction of the Federal Project for Threemile Creek, Mobile, Alabama (hereinafter called the "Project"), was authorized by the Water Resources Development Act of _____(Public Law _____, Congress, _____Session); and

WHEREAS, the City hereby represents that it has the authority and capability to furnish the non-Federal cooperation required by the Federal legislation authorizing the Project, and by other applicable law.

NOW THEREFORE, the parties agree as follows:

1. The City agrees that, if the Government shall commence construction of the Project for Threemile Creek, Mobile, Alabama, substantially in accordance with Federal legislation authorizing such Project, the Water Resources Development Act of _____(Public Law _____, Section _____) the City shall, in consideration of the Government commencing construction of the Project, fulfill the requirements of non-Federal cooperation specified in such legislation, to wit:

a. Provide without cost to the United States all lands, easements, and rights-of-way necessary for construction and maintenance of the project, including suitable areas determined by the Chief of Engineers for initial and subsequent disposal of excavated material, and necessary retaining dikes, or the costs of such retaining works;

b. Accomplish without cost to the United States all alterations and relocations of buildings, transportation facilities, storm drains, utilities, and other structures and improvements necessary for the project;

c. Fulfill the requirements as specified by the provisions of the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970 (PL 91-646) approved 2 January 1971;

d. Provide a cash contribution equal to 50 percent of the first costs allocated to recreation;

e. Maintain and operate the project after completion without cost to the United States in accordance with regulations prescribed by the Secretary of the Army; and,

f. Hold and save the United States free from damages due to the construction operation and maintenance of the project, except where such are damages due to the fault or negligence of the United States or its contractors.

2. The City hereby gives the Government a right to enter upon, at reasonable times and in a reasonable manner, lands which the City owns or controls, for access to the Project for the purpose of inspection, and for the purpose of operating and maintaining the Project, if such inspection shows that the City for any reason is failing to operate and maintain the Project in accordance with the assurances hereunder and has persisted in such failure after a reasonable notice in writing by the Government delivered to the Mayor of the City of Mobile. No operation and/or maintenance by the Government in such

event shall operate to relieve the City of responsibility to meet its obligations as set forth in paragraph 1 of this agreement, or to preclude the Government from pursuing any other remedy at law or equity.

3. This Agreement is subject to the approval of the Secretary of the Army.

IN WITNESS WHEREOF, the parties hereto have executed this contract as of the day and year first above written.

THE UNITED STATES OF AMERICA

BY _____
Colonel, Corps of Engineers
District Engineer

DATE: _____

APPROVED:

_____
Secretary of the Army

CITY OF MOBILE, ALABAMA

BY _____
Mayor

DATE: _____

APPROVED:

SECTION II – PUBLIC INVOLVEMENT

APPENDIX A

SECTION II - PUBLIC PARTICIPATION

Public involvement has played a major role in the study of Threemile Creek since the initial stage public meeting was held on 3 February 1981. The magnitude and frequency of flood events has generated a very high level of interest which has necessitated maintaining an active public involvement program. In addition to the initial public meeting and a public workshop held on 17 December 1981, there have been numerous speaking engagements with local organizations such as: Mobile United, Mobile Community Organization, Threemile Creek Association, and others. There have also been several television and radio appearances as well as newspaper interviews. Throughout the formulation of alternatives, a close working relationship has been maintained with city planners and engineers so that their knowledge of the problems could be utilized in the decision process.

INITIAL PUBLIC MEETING

As shown on page A-II-3, a public meeting was announced when the study began. The meeting was held to inform the public of the study purpose and to gather information which would be helpful during the studies. There were approximately 150 people attending the meeting, and 18 made official statements. Their major concern was, of course, the severe flooding they had received during April and May of 1981. They expressed their opinions on what they thought some of the problems were and what they thought should be done. The majority of them wanted the Corps to undertake a project of some kind and to immediately begin construction. A full transcript of the meeting was published and a public information fact sheet summarizing the meeting was mailed to all known interests. The fact sheet is shown on page A-II-5.

FORMULATION STAGE WORKSHOP

Page A-II-7 shows the cover of a 12 page public information brochure notifying the public of a workshop. The brochure contained charts, maps, and descriptions of the alternatives investigated. The purpose of the workshop was to allow the public to review and comment on each alternative and to express their preference on which type, or types, they thought would best solve the flooding problem. The result was that most participants preferred some type of channel modification or flood plain evacuation. A summary of the workshop is shown on page A-II-9.

FINAL PUBLIC MEETING

On 24 June 1982 a final public meeting was held to present the findings of the study and explain the comprehensive plan for mitigation of the flooding problems. City officials indorsed the plan and residents of the area in attendance voiced their general support of the plan that was presented. The notice prepared for the meeting is shown on page A-II-14 and a summary of the meeting is shown on A-II-15.

ANNOUNCEMENT
OF
PUBLIC MEETING
ON
FLOOD CONTROL
FOR

THREEMILE CREEK

AT
MOBILE, ALABAMA

The Meeting Will Be Held

on

Tuesday, February 3, 1981

at

7:00 PM

at

MURPHY HIGH SCHOOL

AUDITORIUM

100 SOUTH CARLEN STREET

MOBILE, ALABAMA

Threemile Creek
Mobile, Alabama

June 1981

Mobile District

United States Army
Corps of Engineers
Serving the Army
Serving the Nation

PUBLIC INFORMATION FACT SHEET

PROBLEM IDENTIFICATION

The Mobile District of the Corps of Engineers conducted a public meeting on the Threemile Creek flooding problem on 3 February 1981, at the Murphy High School Auditorium in Mobile. The purpose of the meeting was to gather information from the interested public which would help to identify the problems and determine what your views are concerning the flood problems. The comments and views of those who attended the meeting are summarized in this fact sheet and copies of the meeting record are available at the Central Basins Branch. The transcript cost $3.20 to cover printing if picked up at the District Office or $3.90 if requested by mail. Requests by mail should be addressed to U.S. Army Corps of Engineers, Mobile District, P.O. Box 2288, Mobile, Alabama 36628, ATTN: Central Basins Branch.

Views and Comments:

- Development within the watershed has increased runoff
- Urban development within the watershed should be limited
- High tide during heavy rains causes flooding to be worse.
- The creek is too small to carry runoff
- The bridge openings are not large enough
- The Mobile Infirmary levee impedes flows
- The Municipal Park dam break in April 1980 caused flood stages to be higher
- Utility lines crossing the creek impede flows
- The creek is not adequately maintained
- Tributaries to Threemile Creek should be diverted to another outlet
- Establish holding ponds along the stream
- The City would like for the Corps to evaluate impoundments at the University of South Alabama

57-331

- The City is concerned about possible damage to existing facilities if the Corps impounds water in Municipal Park
- The City supports the Corps in the study
- People are concerned with the amount of time the Corps is taking to complete the study.
- The Corps should issue the City a permit to continuously perform maintenance dredging.

These comments, ideas and suggestions which were voiced by people attending the public meeting will be evaluated during the course of our study.

STUDY PROGRESS TO DATE

We are presently developing a computer model of the stream which can accurately estimate the stage of historical floods. Our model of hydrologic conditions was developed based on current stream and basin characteristics and will be used by the study team to determine the effects of alternative projects on water surface profiles. These profiles and other engineering, economic and environmental data will be used to develop and evaluate a variety of solutions to the flood problem.

The study team is now considering the various possible solutions and will be prepared to hold a public workshop in October to allow those who are interested an opportunity to review what we have studied. A draft report of our findings is scheduled to be submitted to our Commander, South Atlantic Division, in March 1982, and, if a project is found to be justified, we hope to have authority for construction in August 1982.

US Army Corps
of Engineers
Mobile District

PUBLIC INFORMATION BROCHURE

THIS IS YOUR INVITATION TO ATTEND A

PUBLIC WORKSHOP

ON

THREEMILE CREEK

IN

MOBILE, ALABAMA

DECEMBER 17, 1981

7:00 P.M.

AT

McGILL-TOOLEN HIGH SCHOOL (IN THE TOOLEN AUDITORIUM)

CORNER OF LAFAYETTE STREET AND OLD SHELL ROAD

If you cannot attend, but wish to express your views after reading this brochure, you may contact:

Pete Woolsey
Mobile District, Corps of Engineers
ATTN: PD-C
P.O. Box 2288
Mobile, Alabama 36628
or call at this phone number
(205) 694-3834

THREEMILE CREEK
MOBILE, ALABAMA

JANUARY 1982

Mobile District

US Army Corps
of Engineers
Mobile District

PUBLIC INFORMATION FACT SHEET

PUBLIC WORKSHOP FOR PLAN FORMULATION

On December 17, 1981 the Mobile District of the Corps of Engineers conducted a public workshop at the McGill-Toolen High School auditorium. The purpose of the workshop was to present the alternatives we have been considering in our studies and to receive views and comments from residents and other public interests so that further studies and recommendations can reflect local desires. About 250 people attended the workshop and there was very good participation in discussion of the pros and cons of each alternative.

We presented the four different basic type of projects which included 14 different alternatives and explained the costs and effects of the alternative.

THIS IS WHAT WE HEARD ABOUT

UPSTREAM RETENTION

- Dams cost too much.
- Permanent water acreage would be about the same for existing ponds.
- Acquisition and relocation of residents in impoundment areas would not be required.
- Consideration would be given to Twelve Mile Creek emptying into the new impoundment.

57-331 O - 86 - 5

UPSTREAM RETENTION (Contd)

- The City's existing retention pond is ok now, but what might happen with another flood?
- A series of low dams having the same effect of height as one tall dam and possibly resulting in a money savings by doing so. One dam cost less than two or more.
- Upstream development limits the size of the dam projects.
- Purchase of homes above the park and raising the height of the dam would cost more than the benefits gained.
- Recommend the Corps quit studying and get the job finished.
- If we cannot have additional storage by lowering the depth of the impoundment area - why not have the dam further upstream. Further upstream or more than one dam cost more and benefits would not increase sufficiently to justify cost.
- Upstream retention is not cost effective, because of small storage sites.
- Maintenance of the alternatives considered would be a local requirement.
- Try to make greater use of the City dam or coordinate retention dam with City project in Municipal Park.
- Existing dam would remain if the larger dam was constructed.

STREAM DIVERSION

- Land acquisitions may require "long time" if a Stream Diversion plan is selected.
- Flood problems on Montlimar Creek and Eight Mile Creek may increase by diverting flows from Threemile Creek.
- Significant flood control benefits for diversion.
- Combination of measures may provide same benefits.
- Project construction might begin in 4 or 5 years.
- Either project could adversely affect the environment and cause opposition from the Environmental Protection Agency (EPA).
- Easements would be obtained by the Corps of Engineers.
- Interim measures for local protection cannot be justified.
- The City will be the local sponsor and provide assurance of cooperation if the Corps recommends Federal participation.
- The B/C ratio provides an indication of feasibility and compares economic savings without flooding to the cost of flood protection.
- Operation and Maintenance costs are included in Average Annual Cost.

STREAM DIVERSION (Contd)

- Annual cost are investment charges at 7-5/8 percent and 50-year life plus operation and maintenance on an annual basis.
- Stream Diversion channels would be dry except during flood conditions.
- Consideration should be given to future development so that the same flooding problems will not occur in another 10 years if development continues.
- The diversion alternatives would still allow water to flow and some flooding to occur along Threemile Creek.
- Plan to be recommended by the Corps must have the support of City government.
- Public needs more time to make a decision on alternatives. However, workshop participation gives Corps a better understanding of public's preference.
- A plan with a low B/C ratio could be selected as the final plan and recommended. However, a recommended channel modification with B/C under 1.0 would be unusual and probably cause lots of review problems for the current President and his Administration.
- Stream Diversion seems to affect only a few people on the upper end of the watershed and we're interested in working on the lower end of the watershed. Benefits for diversion would accrue to downstream interests only.
- Opportunity for diversion to more streams than Montlimar and Eight Mile Creek is not apparent.

CHANNEL MODIFICATION

- The biggest concern relates to stopping Channel Modification studies at Conception St. Road and not considering any project features from that point on out to the river. Work beyond this point would not provide flood control benefits.
- The wide rights-of-way required for the project are excessive.
- Erosion control measures are considered for the stream modification project.
- The City would be required to perform Operation & Maintenance of the project.
- Homes and businesses would be partially protected by channel modification.
- The channel would not be paved.
- The City and Corps can agree to the selected plan and the Corps can recommend it for Federal development. Federal criteria will be used for design and formulation, but local acceptance is required before a favorable recommendation will be made by the Corps.

CHANNEL MODIFICATION (Contd)

- Existing bridges and roadways are acting as dams during flood events.
- Runoff will not be increased due to channel modification, but the velocity and concentration time will change.
- Need to discuss the uncontrolled development and its affect on the lower portions of Threemile Creek and take into account any future development. Local requirements for Federal participation will insure wise use of floodplain lands.
- Present width and depth of Threemile Creek would be considerably enlarged with either of the channel modification alternatives presented.

NONSTRUCTURAL MEASURES

- Such a plan could be implemented in about two years after authorization and funding.
- Carver Court would be part of the acquisition alternative for the 10 and 25-year floodplains.
- It is claimed that flood damages did not start until the last three floods.
- Floodproofing can be viable for some commercial and industrial structures but is not recommended for houses.
- Recreation development would be appropriate land use after evacuation of structures is completed.
- Evaluation of the Mobile Infirmary levee has not been made.
- The Mobile Infirmary would not be purchased or relocated.
- FEMA's criteria for purchase of homes was not discussed, since representatives from FEMA were not in attendance.
- Insurance for some residents has been cancelled, and it might take 6 years before any Corps project materializes.
- Crime might increase if a few homes are left in an area as a result of the nonstructural alternative.
- It was claimed that past acquisitions were made of properties other than those announced.
- Request the Corps maintain close coordination with FEMA on their 1362 plan.
- A number of people were under the impression that the Corps is already in the process of purchasing homes which in fact is not the case.
- A proposal was made to combine channel modification with nonstructural.
- The removal of houses from the floodplain does little for hydraulic efficiency. It might slow runoff and reduce flood stage but not enough to measure and claim any benefit for remaining structures.

NONSTRUCTURAL MEASURES (Contd)

- Purchase value of houses equals market value which can be determined on appraisals made at the time of purchase.
- Individuals to be evacuated would qualify for benefits under Public Law 91-646 which include:
  a. Moving expenses incident to relocation from dwelling (optional fixed payment allowed in lieu of actual expenses).
  b. Direct losses of tangible business property where the cost of moving exceeds the value of the property.
  c. Searching expense to find new site for business (no searching expense allowed for locating replacement dwelling).
  d. Moving expenses for business (optional fixed payment allowed in lieu of actual expense).
  e. Replacement housing payment not to exceed $15,000 to homeowners who owned and occupied their homes for 180 days or more prior to initiation of negotiations to acquire the property.
  f. Replacement housing payment not to exceed $4,000 for tenants who occupied their homes 90 days or more before initiation of negotiations to acquire the property and homeowners who owned their homes for less than 180 days but at least 90 days (benefit is in form of down payment or rental supplement).
  g. Costs of conveying property to the Government.

WORKSHOP CONCLUSION

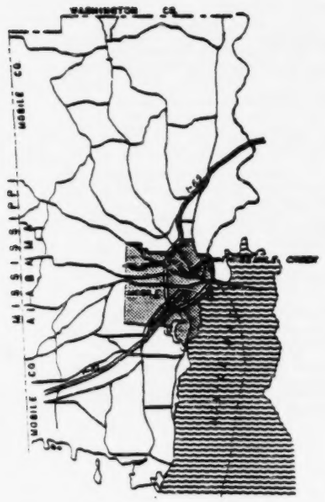
At the close of the workshop participants were allowed to indicate their first and second preference of the type of project to be carried into detailed design. Although each type of project received some votes, the majority of the people seemed to prefer some type of channel modification or floodplain evacuation. Some suggested that a combination of channel modification and floodplain evacuation would create a more complete and effective flood damage retention plan.

IN THE FUTURE

Our next step in the study process is to proceed with detailed design of channel modification and evaluation of evacuation measures to be most effective in reducing flood damages. In plan selection it will also be necessary to minimize environmental impacts and maintain local acceptance. Public participation and the input obtained at the workshop provide valuable data in the decision making by local and Federal officials. Once we have defined the plan to be recommended, a report will be prepared and made available at the cost of reproduction. The Corps' report and environmental statement will be made available in June 1982.

PUBLIC MEETING

FLOOD CONTROL STUDY
FOR
THREEMILE CREEK, MOBILE, ALABAMA



WHY?

REVIEW PLANS

WHEN?

THURSDAY
JUNE 24, 1982
AT 7:00 P.M.

WHERE?

MOBILE GAS SERVICE
CORPORATION AUDITORIUM
2828 DAUPHIN STREET
MOBILE, ALABAMA

WHO?

RESIDENTS ALONG THREEMILE CREEK

CITIZENS OF MOBILE

FEDERAL, STATE AND LOCAL AGENCIES

ALL OTHER INTERESTED PARTIES

SUMMARY OF FINAL
PUBLIC MEETING

On 24 June 1982, a final Public Meeting on the Threemile Creek flood study was held in Mobile, Alabama. The meeting was attended by 181 people, including a City Commissioner, Congressional staff, property owners, Federal agencies, environmental, and other interests.

The meeting was called to order at 7 p.m. by LTC Ronald Krizman. After summarizing the study and explaining the purpose of the meeting, LTC Krizman described the Comprehensive Plan the Corps had arrived at and what work would be required before a project could be authorized by Congress.

During the meeting there were 11 speakers whose interest included:

- What homes will be purchased?
- Environmental effects of construction.
- How soon can construction begin?
- Will the Corps inspect the completed project periodically?
- What level of protection will the project provide?

The major concern expressed by the speakers, dealt with the need to construct the project as soon as possible. Everyone seemed to be in favor of the project and no one expressed opposition.

After the meeting adjourned, Corps personnel were on hand to answer specific questions from individuals who wanted to know if they were to be relocated.

SECTION III – COORDINATION

SECTION III

Agency Coordination

Coordination of the report on Threemile Creek has been effected with the Mayor and City Commissioners of Mobile and Federal, state, and local agencies. Exchange of data concerning the progress and findings of planning activities was accomplished by the use of letters and/or public notices and brochures. The mailing list showing circulation of the draft report and environmental impact statement is provided first in this section of Appendix A and followed by letters received during the evaluation and coordination phases of processing the report.

The Fish and Wildlife Coordination Act Report, in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661 et seq.), has been completed on the Interim Survey Report. The report cited four items of concern which are:

1. The relocation alternative be an integral part of the selected plan.
2. Where possible the channel be widened on the side with the least habitat value
3. Dredged material be placed in the approved 22-acre site at Hickory Street Landfill and the 88-acre site at I-65 unless other suitable upland areas are identified.
4. Areas cleared from channel work and evacuation be vegetated with plantings of value to wildlife.

Response to:

1. Flood plain evacuation was considered during the formulation process, but, was not included in the recommended plan due to the lack of economic justification.
2. During final design consideration will be given to shifting the channel to preserve habitat.

3 and 4. These items are covered in the main report.

THREEMILE CREEK MAILING LIST
Federal Government

Regional Administrator
Environmental Protection Agency
345 Courtland Street, NE.
Atlanta, GA 30308

Director
Office of Water Programs
Environmental Protection Agency
345 Courtland Street, NE.
Atlanta, GA 30308

Mr. Gerald Miller
EPA, EIS Review
345 Courtland Street
Atlanta, GA 30308

Director, Regional Air Pollution
Center
Environmental Protection Agency,
Region IV
345 Courtland Street, NE.
Atlanta, GA 30308

Chief, Bureau of Power
Federal Energy Regulatory Comm.
Washington, DC 20426

Chief, Environmental Assessment
Division
National Marine Fisheries Service
Duval Building, 9450 Kroger Blvd.
St. Petersburg, FL 33702

US Gulf Coast Shellfish Sanitation
Research Center
Dauphin Island, AL 36528

Commander D. K. Carey
US Coast Guard Base
Brookley Complex, Bldg. 101
Mobile, AL 36615

Mr. Thomas D. Thornhill
US Fish and Wildlife Service
2700 Mary Street
Slidell, LA 70458

Mr. Glenn C. Woodard, Jr.
Regional Director
Federal Insurance Administration
US Department of Housing and
Urban Development
1371 Peachtree Street, NE.
Atlanta, GA 30309

District Engineer
US Geological Survey
75 Spring Street
Suite 1772
Atlanta, GA 30303

Regional Administrator
Federal Highway Administration
Department of Transportation
1720 Peachtree Road, NW., Suite 200
Atlanta, GA 30309

Administrator
Federal Railroad Administration
400 Seventh Street, SW.
Washington, DC 20591

Hydrologist in Charge
US Geological Survey
PO Box 56
Montgomery, AL 36101

Chief, Water Resources and
Transportation Studies Division
Heritage Conservation and Recreation
Service
75 Spring Street, SW., Suite 1176
Atlanta, GA 30303

Regional Hydrologist, SE Region
US Geological Survey
75 Spring Street, #772
Atlanta, GA 30303

District Chief
US Geological Survey
PO Box V
University, AL 35486

THREEMILE CREEK MAILING LIST
Federal Government

Chief, Hydrologist
Geological Survey
Department of the Interior
Washington, DC 20242

Regional Supervisor
Division of Ecological Services
US Fish and Wildlife Service
75 Spring Street, SW.
Atlanta, GA 30303

Area Manager
US Fish and Wildlife Service
200 E. Pascagoula Street
Suite 300
Jackson, MS 39201

Special Assistant to the Secretary
Heritage Conservation and
Recreational Services
Department of the Interior
75 Spring Street, SW., Suite 1176
Atlanta, GA 30303

Regional Director
Southeast Region
Heritage Conservation and
Recreational Services
75 Spring Street, SW., Suite 1176
Atlanta, GA 30303

Director
US Public Health Service
Dauphin Island, AL 36528

Administrator, Federal Ins. Adm.
Federal Emergency Management Agency
451 7th Street
Washington, DC 20410

Director
Department of Housing and
Urban Development
Water Resources Division
451 7th Street, SW., Room 7100
Washington, DC 20410

Regional Director
PHS Region IV DHEW
50 7th Street, NE., Room 134
Atlanta, GA 30323

Office of the Chief Engineer
Public Health Service
Room 1842, Parklawn Building
5600 Fesheres Lane
Rockville, MD 20852

The Administrator
Environmental Protection Agency
Waterside Mall
4th and M Street, SW.
Washington, DC 20460

Asst. Secretary, Program Development
& Budget
ATTN: Dir. Off. of Environ Proj.
Review
Department of the Interior
Washington, DC 20240

Acting Director
Environmental Affairs Office
Room 3425, Department of Commerce
14th & E Streets, NW.
Washington, DC 20230

Reg. Dir. Nat'l Oceanic & Atmos Admn
Nat'l Marine Fisheries Service
SE Regional Office, Region 2
Duval Bldg., 9450 Gandy Blvd.
St. Petersburg, FL 33702

National Marine Fisheries Service
Environmental Assessment Branch
3500 Delwood Beach Road
Panama City, FL 32407

Regional Administrator
Department of HUD
Richard B. Russell Federal Building
75 Spring Street
Atlanta, GA 30303

THREEMILE CREEK MAILING LIST
Federal Government

Assistant Regional Administrator
for CPD
ATTN: Environmental & Standards Officer
Dept. of HUD, Region IV
Richard B. Russell Federal Building
75 Spring Street, SW.
Atlanta, GA 30303

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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
NATIONAL SPACE TECHNOLOGY LABORATORIES
NSTL STATION, MS 39529

Ref. ES2-318

February 1, 1982

Colonel Robert H. Ryan
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628

Dear Sir:

This letter concerns fish and wildlife resources and impacts associated with your proposed alternatives for flood control on Three Mile Creek in Mobile County, Alabama. Your study of Three Mile Creek is being conducted under provisions of Section 205 of the Flood Control Act of 1948 as amended. This letter is provided as technical assistance for incorporation in the Corps of Engineers Draft Feasibility Report to Division. Our official report within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act will be provided your agency following your review of this letter and our review of the Draft Feasibility Report for inclusion into the final report.

Four flood control alternatives, each with varying degrees of design, were presented at a public workshop held at Mobile, Alabama on December 17, 1981. These were (1) upstream retention dam, (2) stream diversion to Eight Mile or Montlimar Creeks, (3) channel modification, and (4) nonstructural. The general consensus of the workshop participants was that the nonstructural (floodplain evacuation) and channel modification alternatives would be the most effective. There was also some favorable reaction to combining the two alternatives. We have been advised by the project manager, as well as information provided in the January 1981 workshop fact sheet, that the retention dam and diversion alternatives will be dropped from further study. The emphasis for future studies will be placed on the channel modification and nonstructural (floodplain management) alternatives.

Three Mile Creek originates in western Mobile near Cody Road and flows easterly for a distance of approximately 14 miles before emptying into the Mobile River north of the Alabama State Docks. The terrain within the watershed varies from gently rolling in the headwaters to relatively flat in the lower end. Elevations range from about 220 feet above mean sea level in the headwaters to near sea level at the mouth. The total drainage area is about 28 square miles. The average width of Three Mile Creek varies from about 10 feet in the upper end to 80 feet in the lower end. The watershed is heavily urbanized, and the city has channelized

several reaches of the stream in association with flood control. The floodplain contains remnant portions of forested upland and wetland tracts. Development has removed much of the natural riparian vegetation. The Fish and Wildlife Service provided the Mobile District a resource inventory in May 1981 which described the flora and fauna along Three Mile Creek.

Fish populations within the project boundaries (approximately 9,000 feet west I-65 to Telegraph Road) have been drastically reduced as a result of development, pollution, and channelization. The loss of riparian vegetation and natural stream contours has eliminated much of the natural feeding and spawning habitat. Both urban and commercial pollution have also adversely impacted the stream fishery. Only the lower end of Three Mile Creek, in the tidal reach, would be capable of supporting any appreciable sport or commercial fish species. However, the lower reach is polluted and numerous fish kills have been reported in this area. Species such as bluegill, croaker, striped mullet, and freshwater drum have been reported through state surveys of the creek.

Terrestrial habitat types in the project area basically consist of upland forest (pine and mixed pine-hardwoods), open brush, and forested wetlands. These habitats are capable of supporting such wildlife species as squirrels, rabbits, furbearers, quail, dove, snipe, woodcock, non-game birds, waterfowl, reptiles, and amphibians.

Endangered and threatened species could inhabit the project area. To be in compliance with the Endangered Species Act of 1978, your agency should request a list of endangered and threatened species from the Area Manager, U.S. Fish and Wildlife Service, Jackson, Mississippi. This action is necessary to initiate the endangered species process which will assist you in meeting your responsibilities under the Act. Section 7(c) of the Endangered Species Act Amendments of 1978 requires federal agencies to provide biological assessments for the species which are likely to be affected. The biological assessment shall be completed within 180 days after the date on which initiated, before any contract for construction is entered into and before construction is begun. Project environmental impact statements may suffice in part or in total as the biological assessment. Further information regarding the requirements of the biological assessment will be provided with the listing.

A major concern of the Fish and Wildlife Service involves the forested wetlands remaining in the Three Mile Creek Floodplain. Species such as cypress, oak, sycamore, bay, and willow are representative of this habitat type. In preparing the resource inventory, we estimated that approximately 800 acres of forested wetlands are present along Three Mile Creek. The major portions of the wetlands existing within the proposed limits of the project area are west of Interstate 65 up to the

municipal park lakes, about ½ mile east of Interstate 65, and from Davis Avenue to Telegraph Road. The largest contiguous tract of forested wetlands are located between Davis Avenue and Telegraph Road (approximately 400 acres). Other scattered tracts occur between these areas. A habitat map provided in the resource inventory shows the general location of these forested wetlands.

The values of forested wetlands to fish and wildlife are well documented. They provide food and cover for many species of wildlife and offer excellent fish spawning and feeding areas when inundated. Wetlands also contribute valuable detrital food material to the downstream estuarine system. In addition, wetlands serve as natural filtration and flood control systems which is exemplified by those wetlands between Davis Avenue and Telegraph Road. They provide a valuable function in their ability to store and absorb floodwaters. Thus further development in these and other upstream wetlands could augment the current and future flooding problems.

As previously stated, two general alternatives are being considered for future planning which are channel modification and nonstructural (floodplain evacuation). The combination of these alternatives is also being considered. Our following analysis will provide an overview of these actions and the expected impacts.

Channel Modification

The proposed channel modification basically consists of three channel alternatives of varying widths which extend from about 9,000 feet west of I-65 to Telegraph Road. These are 120 and 100 foot, 90 and 75 foot and 148, 90, 70, 75 foot bottom widths. Each of these plans will displace 510, 420,and 403 acres of land, respectively. Adverse impacts of each of these channel modifications on wildlife will primarily be dependent on the degree of widening and quality of habitat displaced. Forested wetland losses will be a major concern. Review of our wetland map reveals that the 120 and 100 foot and 148, 90, 70, 75 foot widths would apparently result in the greatest loss of forested wetlands. The forested wetlands immediately west and east of I-65 are located primarily on one side of the channel. Therefore, wetland losses in these areas could depend on the side of the channel which the work is conducted. In the area below Davis Avenue each side of the channel is well vegetated with forested wetlands. Any work in this area would resulted in wetland losses.

The disposal sites for dredged material would also be a major concern with any channel modification design. Disposal in low productive upland areas would be preferred from a fish and wildlife standpoint provided commercial or other acceptable uses cannot be identified.

Alteration of the floodplain hydrology could have some impact on the community structure of the forested wetlands. Most effected would be those wetlands above Davis Avenue, since those below the Avenue are mostly in a tidal area where little change in the hydrology from channel modification is expected. Any natural changes in the forested wetland values above Davis Avenue from alterations in hydrology regimes are expected to be minor and adverse impacts on fish and wildlife limited. More specific analysis of the effects these alterations could have on wetlands will be conducted once detailed designs are provided in the draft feasibility report.

In view of the current degraded condition of Three Mile Creek within the project area, fish populations are expected to be limited. Increased turbidities would occur but this would be temporary and should not have any appreciable long-term adverse effect on aquatic life of the lower reaches of the creek or Mobile River.

Nonstructural

The nonstructural alternative would be the most preferred from a fish and wildlife standpoint. As proposed 2-year, 5-year, 10-year, and 25-year floodplain evacuation plans are being studied. Those would require 278, 475, 528, and 614 acres of land, respectively, for removal of damageable structures in the floodplain. Other objectives considered for this plan include improving the natural attractiveness of Three Mile Creek and evacuated areas by planting a variety of trees and shrubs and restricting the building of damageable structures in the floodplain. The overall effect of any of these plans would allow a portion of the original floodplain to retain its natural function of temporary flood storage. As a result, the fish and wildlife impacts of this plan should be positive.

Combination of Channel Modification and Nonstructural

The degree of impact of the combination of those alternatives would naturally be dependent on the plans selected. For example, a smaller channel modification plan with the 25-year floodplain evacuation would obviously be preferred over a larger channel and 2-year floodplain plan.

Discussions and Recommendations

The magnitude of impact on fish and wildlife will primarily depend on the size and area of channel construction as well as the degree of floodplain evacuation. Various mitigation measures could also be incorporated to reduce adverse project impacts.

Obviously, the best plan from a fish and wildlife standpoint would be the one which minimizes habitat destruction (primarily wetlands) and restores the largest area of natural floodplain through evacuation. It appears that wetland habitat destruction in the vicinity of I-65 could be further reduced by widening the channel toward the side away from wetlands where possible. Since the forested wetlands between Davis Avenue and Telegraph Road are on each side of the creek, it would be preferred if the channel construction would terminate near Davis Avenue instead of going all the way to Conception Street. This appears feasible since floodwaters should fan out through wetlands in this reach and therefore possibly eliminate the need for channel construction in this area.

Areas that would be proposed for dredged material are also a major concern. Once detailed plans have become available, we would like to participate in field surveys to assist in the selection of the most environmentally sound disposal sites. It would be preferable if the material could be taken out of the floodplain for commercial or other uses. However, if this is not immediately feasible the material should be stockpiled for future removal.

Channel work would likely result in denuding of the stream banks and adjacent areas. In such cases, we recommend that these areas be re-vegetated immediately.

Since a major problem with Three Mile Creek involves encroachment into the floodplain, we recommend that the floodplain be appropriately zoned from future development. This would be a most effective method of preventing future loss of fish and wildlife resources that are already becoming extremely scarce in the area.

Depending on the plan selected, floodplain evacuation could result in the conversion of from 278 to 614 acres of developed land to natural floodplain habitat. We recommend the areas evacuated be vegetated for appropriate wildlife and human outdoor recreational utilization, such as parks or wildlife sanctuaries. In cases where channel modification may be combined with floodplain evacuation, the restoration of the original floodplain could help mitigate fish and wildlife habitat losses resulting from construction.

In summary, the Fish and Wildlife Service favors the nonstructural alternatives. If channel modification is required, we recommend that the alternative least damaging to wetlands be selected. The following

are our recommendations relative to both the channel modification and nonstructural plans or combination of the two:

1. Channel widening should be directed toward the side providing the least value as fish and wildlife habitat, avoiding wetlands where possible.

2. Consideration should be given to reducing the length of channel construction between Davis Avenue and Conception Street to prevent wetland destruction.

3. Dredged material should be taken out of the floodplain.

4. Denuded areas along the creek resulting from construction should be vegetated immediately.

5. The floodplain should be zoned against future development.

6. Areas in which structures are evacuated should be used for flood-proof purposes. Parks and wildlife sanctuaries are examples of such uses which could be compatible with expected hydrological conditions.

We appreciate the opportunity to provide these comments for inclusion into the Draft Feasibility Report. Once specific project designs are identified, we will provide your agency with comments and recommendations through our Fish and Wildlife Coordination Act Report.

Sincerely yours,

J. Paul Smith
Field Supervisor

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 9 1982

OFFICE OF THE ADMINISTRATOR

Dear Mr. Mallory:

I am writing to verify the official filing of the EIS entitled:

Draft: Threemile Creek, Flood Control and Recreation Plan,
Mobile, Mobile County, Alabama (#E20365)

This EIS was received by the Office of Federal Activities on June 4, 1982. It has been determined the above document meets the requirements for filing an EIS as set forth under Section 1506.9 of the CEQ Regulations. Accordingly, EPA has scheduled publication of the Notice of Availability in the Federal Register dated June 11, 1982 and the public review period is scheduled to terminate on July 26, 1982.

If you have any questions or concerns relating to this matter, please do not hesitate to contact me or Ms. Jan Lott of my staff on 245-3006.

Sincerely,

Kathi L. Wilson
Management Analyst
Office of Federal Activities (A-104)

Mr. Jack C. Mallory
Mobile District
US Army Corps of Engineers
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PO Box 2288
Mobile, Alabama 36628

United States Department of the Interior

GEOLOGICAL SURVEY
P. O. Box 56
Montgomery, Alabama 36101

June 17, 1982

U.S. Army Corps of Engineers
Mobile District
Attn: ED-C
P. O. Box 2288
Mobile, Alabama 36628

Re: Interim Survey Report & Environmental Impact Statement Threemile Creek, Mobile, Alabama May 1982

Gentlemen:

The U.S. Geological Survey staff in Alabama has reviewed this report with special attention to our field of expertise. Only two minor discrepancies were found.

Notice that in the SYLLABUS, 2nd paragraph, the drainage area is given as 39 square miles, whereas, in the introduction on page 1 and Appendix C, page 1, the drainage area is 29 square miles.

Appendix D, page 1, paragraph two, the "(29 miles)" should either be (29 square miles), or (14 miles), depending on whether the intent was to refer to drainage area or basin length. The "four miles" referred to in the latter part of the sentence should similarly be considered.

Sincerely yours,

C. A. (Jerry) Pascale
District Chief

STATE OF ALABAMA

ALABAMA HISTORICAL COMMISSION

725 MONROE STREET

MONTGOMERY, ALABAMA 36104-3898

F. LAWERENCE OAKS
EXECUTIVE DIRECTOR

TELEPHONE NUMBER
832-6621

June 24, 1982

Mr. Willis E. Ruland
Department of the Army
Mobile District, Corps of Engineers
Post Office Box 2288
Mobile, Alabama 36628

Re: Review of draft "Cultural Resources Reconnaissance of Three Mile Creek, Mobile, Alabama"

Dear Mr. Ruland:

The Alabama Historical Commission has reviewed the above referenced draft report. Based upon our review, we offer the following comments:

1. The Alabama Historical Commission concurs with the recommendation on page 9 that; a) sufficient field work and archival research have been accomplished to date to establish further study requirements, b) the prehistoric site reconnaissance conducted by Spies and Rushing is adequate for the areas where they surveyed, c) if the impact area is altered and any of the sites discovered by Spies and Rushing will be effected, then these sites should undergo further study to determine if they are eligible for the National Register of Historic Places, d) an intensive field reconnaissance for prehistoric sites should be conducted of those areas not surveyed by Spies and Rushing and in which the preliminary survey by Sechinger and Robinson indicated was not extensively disturbed, e) future historic (standing structure) field surveys should be conducted (these should consist of 100% coverage), f) a thorough archival and literature search should be conducted.

2. The eight bridges to be replaced or altered should be included in the survey and each bridge should be evaluated according to the criteria of the National Register of Historic Places.

3. The report states that the four Civil War fortifications appear to be out of the impact area. This should be positively verified.

4. The report states that the preliminary historic field survey noted four residential structures meeting the age criteria of the National Register of Historic Places and that three of these are out of the impact area. Will the project have any indirect impact upon these structures? The fourth structure (a Victorian cottage) should be evaluated

in terms of the criteria of the National Register of Historic Places since it is scheduled for demolition.

5. The archival research and subsequent field reconnaissance should give careful study to an American camp located on Three Mile Creek between August and November, 1814. The camp was occupied by the 3rd Regiment of the U.S. Infantry and was located near a mill pond between two fords (noted in Andrew Jackson's military correspondence, microfilm, National Archives). The mill pond site and ford described on page 14, paragraph two of Spies' and Rushings' report sounds like the possible location of this camp.

If you have any questions regarding our comments, please contact us.

Sincerely,

F. Lawerence Oaks
State Historic Preservation Officer

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4PM-EA

JUN 1982

Colonel Robert H. Ryan
District Engineer
U. S. Army Corps of Engineers
Post Office Box 2288
Mobile, Alabama 36628

SUBJECT: Channel Enlargement
Threemile Creek
Mobile, Alabama
SAMPD-EC: PN FP82-TC01-03

Dear Colonel Ryan:

This is in response to the public notice dated June 15, 1982, relating to the channel enlargement of Threemile Creek for the control of floods in Mobile, Alabama.

We have no objection to the project.

Sincerely yours,

Arthur G. Linton, P.E.
Federal Activities Coordinator
Environmental Assessment Branch

cc:
See attached list.

cc: Mr. Gary Hickman, Acting Area Manager
U.S. Fish & Wildlife Service
Jackson, Mississippi

Mr. J. Paul Smith, Field Supervisor
U.S. Fish and Wildlife Service
NSTL Station, Mississippi

Mr. James W. Warr, Director
Alabama Water Improvement Commission
Montgomery, Alabama

Mr. Hugh A. Swingle, Director
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Dr. Bruce Trickey, Executive Director
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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ATLANTA GEORGIA 30365

4PM-EA

JUN 1 1982

Colonel Robert H. Ryan
District Engineer
U. S. Army Corps of Engineers
Post Office Box 2288
Mobile, Alabama 36628

SUBJECT: Channel Enlargement
Threemile Creek
Mobile, Alabama
SAMPD-EC; PN FP82-TC01-03

Dear Colonel Ryan:

This is in response to the public notice dated June 15, 1982, relating to the channel enlargement of Threemile Creek for the control of floods in Mobile, Alabama.

We have no objection to the project.

Sincerely yours,

Arthur G. Linton, P.E.
Federal Activities Coordinator
Environmental Assessment Branch

cc:
See attached list.

cc: Mr. Gary Hickman, Acting Area Manager
U.S. Fish & Wildlife Service
Jackson, Mississippi

Mr. J. Paul Smith, Field Supervisor
U.S. Fish and Wildlife Service
NSTL Station, Mississippi

Mr. James W. Warr, Director
Alabama Water Improvement Commission
Montgomery, Alabama

Mr. Hugh A. Swingle, Director
Alabama Division of Marine Resources
Dauphin Island, Alabama

Dr. Bruce Trickey, Executive Director
Alabama Coastal Area Board
Daphne, Alabama

Dr. Edward Keppner, Field Supervisor
National Marine Fisheries Service
Panama City, Florida

Mr. Harold B. Allen, Acting Regional Director
National Marine Fisheries Service
St. Petersburg, Florida 33702

57-331 O - 86 - 6

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
DIVISION OF ECOLOGICAL SERVICES
NATIONAL SPACE TECHNOLOGY LABORATORIES
NSTL STATION, MS 39529

July 12, 1982

Reference: ES2-401

District Engineer (SAMPD-EC)
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628

Dear Sir:

Reference is made to Public Notice No. FP82-TC01-03 in which the Corps of Engineers propose channel modification of approximately 5.6 miles of Three Mile Creek. Also proposed is the relocation of 81 buildings and provision for recreation facilities in the project right-of-way. Our comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and constitute the official position of the Department of the Interior.

The Fish and Wildlife Service has been actively involved in this study with the Mobile District. A Planning Aid Report was submitted to the Corps on February 1, 1982 which described fish and wildlife interest and concerns relative to project actions.

In general we support the nonstructural floodplain evacuation plan. Hopefully this will allow portions of the floodplain to revegetate and provide fish and wildlife habitat. Our specific comments relative to this project will be provided in our official Fish and Wildlife Coordination Act Report.

Sincerely yours,

J. Paul Smith

J. Paul Smith
Field Supervisor

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Region
9450 Koger Boulevard
St. Petersburg, FL 33702

July 13, 1982

F/SER613/DJT
904-234-5061

Colonel Robert H. Ryan
District Engineer, Mobile District
Department of the Army, Corps of Engineers
P.O. Box 2288
Mobile, AL 36628

Dear Colonel Ryan:

The National Marine Fisheries Service has reviewed the project plans advertised in the following federal projects. We anticipate that any adverse effects that might occur on marine and anadromous fishery resources would be minimal and, therefore, do not object to the federally authorized projects.

NOTICE NO.	PROJECT	NOTICE DATE	DUE DATE
FP82-TC01-3	Three Mile Creek, AL - Channel enlargement	6/15/82	7/15/82
FP82-TM03-03 (Add.)	Twenty Mile, Wolf & Osborne Creeks Hwy 362 Bridge crossing	6/22/82	7/22/82

Sincerely yours,

Edward J. Keppner /at

for Richard J. Hoogland, Chief
Environmental Assessment Branch

STATE OF ALABAMA

WATER IMPROVEMENT COMMISSION

Ira L. Myers, M.D.
Chairman, State Health Officer

John McMillan, Jr.
Vice Chairman
Commissioner, Department of
Conservation and Natural Resources

Office Location
2721 Gunter Park Dr., West
Montgomery, Alabama

James W. Warr
Director

Commission Members:
Toney A. Brasell, Sr., Fairhope
Charles O. Cargile, Hueytown
Frank E. Lindstrom, Sr., Birmingham
David L. Thomas, Montgomery
Dr. John H. Winston, Jr., Montgomery

Mailing address
Public Health Services Bldg.
Montgomery, AL 36130
Telephone 205/277-3630

August 23, 1982

District Engineer
Corps of Engineers
P. O. Box 2288
Mobile, AL 36628

RE: Joint Public Notice No. FY82-TC01-03
Channel Enlargement, Three Mile Creek,
Mobile, Alabama

ATTN: Mr. Joseph R. Wilson

Dear Sir:

This office has completed review of the above-referenced project. It has been noted that there were no objections to the proposal from those who commented during the advertising period. Based on the materials received, the following is deemed appropriate for a period of five (5) years:

Because action pertinent to water quality certification is required by Section 401 (a)(1) of the Clean Water Act, 33 USC §1251, et seq., we hereby issue official certification that the discharge resulting from the proposed activities as submitted will comply with applicable water quality standards established under Section 303 of the Clean Water Act and Title 22, Section 22-22-9(g), Code of Alabama 1975. We further certify that there are no applicable effluent limitations under Sections 301 and 302 nor applicable standards under Sections 306 and 307 of the Clean Water Act in regard to the activities specified.

As a condition of this certification, the Water Improvement Commission's technical staff requests that the Corps utilize the best practical technology to minimize the impacts of both dredging and disposal operations.

Sincerely,

For James W. Warr, Director

Robert W. Cooner
Biologist, Technical Staff

COASTAL AREA BOARD
CERTIFICATION OF CONSISTENCY FOR FEDERAL ACTIVITY
OR A FEDERAL PROJECT OR ACTIVITY

TO: Willis E. Ruland, Mobile District, U. S. Army Corps of Engineers

FROM: Alabama Coastal Area Board
P.O. Box 755
Daphne, Alabama 36526
(205)626-1800

CAB Reference # CDEP-82-06

1. Application Number (assigned by federal agency) FP82-TC01-03

Date of Receipt of Application 8-2-82

2. Name and Address of Applicant

Name Mobile District, U. S. Army Corps of Engineers
Street or Box P. O. Box 2288
City, State, Zip Mobile, Alabama 36628
Home Phone _____ Business Phone _____

3. Category of Project or Activity (e.g. road construction):

Three Mile Creek Flood Control Project

4. [X] The Coastal Area Board has reviewed this federal project or activity and Certification of Consistency and has found it to be consistent with the Coastal Area Management Program. This approval is conditional upon continued compliance with the management program and the following conditions: The applicant shall ensure that 1) the project is carried out according to the design standards contained in the project description.

[ ] The Coastal Area Board has reviewed this federal project or activity and Certification of Consistency and has found it to be inconsistent with the Coastal Area Management Program. The reasons and supporting details for the objection and alternative means suggested by the CAB to conduct the use in accordance with the management program are attached. A copy of this notice of objection will be sent to the Assistant Administrator for Coastal Zone Management, NOAA.

Spoke [illegible] Director

STATE OF ALABAMA
ALABAMA HISTORICAL COMMISSION
725 MONROE STREET
MONTGOMERY, ALABAMA 36104 3896

F. LAWERENCE OAKS
EXECUTIVE DIRECTOR

TELEPHONE NUMBER
832 6621

July 27, 1982

Mr. Joseph R. Wilson
Department of the Army
Mobile District, Corps of Engineers
Post Office Box 2288
Mobile, Alabama 36628

Re: Public Notice No. MP82-TC01-03
Proposed discharge of dredged and fill material
Threemile Creek
Mobile County, Alabama

Dear Mr. Wilson:

The Alabama Historical Commission has commented previously on the Threemile Creek project prior to the issuance of the Public Notice. A preliminary cultural resource assessment has been conducted by Corps of Engineer archaeologists and based upon our review of this report, we have recommended additional investigations.

Thank you for your time in this matter.

Sincerely,

F. Lawerence Oaks

F. Lawerence Oaks
State Historic Preservation Officer

FLO/BMB/jhg

United States Department of the Interior
FISH AND WILDLIFE SERVICE
75 SPRING ST.S.W.
ATLANTA, GEORGIA 30303-3376

OCT 2 1 1982

Colonel Robert A. Ryan
Commander and District Engineer
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Alabama 36628

Dear Colonel Ryan:

This letter constitutes the report of the Fish and Wildlife Service (FWS) on your feasibility study for Threemile Creek in Mobile, Alabama. Authority for the feasibility study is contained in House Public Works Committee Resolution adopted October 12, 1972. This resolution requested a study for flood protection, wise use of floodplains, bank and channel stabilization, restoration and protection of estuarine areas, and other purposes. Our report is submitted in accordance with the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661 et seq.) and was prepared in cooperation with the Alabama Game and Fish Division and the National Marine Fisheries Service.

Threemile Creek originates in western Mobile near Cody Road and flows easterly for a distance of approximately 14 miles before emptying into the Mobile River north of the Alabama State Docks. The terrain within the watershed varies from gently rolling in the headwaters to relatively flat in the lower end. Elevations range from about 220 feet above mean sea level in the headwaters to near sea level at the mouth. The total drainage area is about 28 square miles. The average width of Threemile Creek varies from about 10 feet in the upper end to 80 feet in the lower end. The watershed is heavily urbanized, and the city has channelized several reaches of the stream.

The following alternative plans were considered in detail: (1) no action; (2) channel modification; (3) channel modification and relocation; and (4) channel modification, relocation, and recreation (the recommended plan).

Channel modification would involve increasing the channel width of Threemile Creek from about 2,000 feet downstream of the Stone Street Bridge to 6,270 feet upstream of I-65. The total distance of channel work would be about 5 miles. The lower 7,800 feet of channel would have a bottom width of 148 feet. This would be reduced to 90 feet for the next 6,580 feet. At this point a drop structure would raise the bottom elevation 7.6 feet. Here the channel would be reduced to a 75-foot bottom width and would continue upstream for about 8,000 feet to an area just below I-65. A drop structure 5.6 feet high would be installed at this point. A 9-foot drop structure would be installed near the downstream end of the culvert under I-65. Above I-65, the channel width would be reduced to 70 feet to the termination of the project about 6,770 feet upstream. Another drop structure (4.6 feet)

would be constructed in the upper reach near Moffat Road. Eight of 10 bridges within the limits of the channel would require modification or replacement.

The rights-of-way (ROW) for the 5-mile channel would require a 20-foot wide strip along the top of each bank plus the new channel width. The relocation required with the channel modification plan would include 42 homes and 2 businesses. Also included for relocation would be sewer lines, water and gas lines, telephone lines, etc. The total ROW would require about 122 acres. Of this, about 22 acres would be allowed to revegetate.

The ROW would be planted with grasses, shrubs, and trees to provide a green belt along the stream for aesthetics, wildlife habitat, and erosion control. Channel enlargement would involve dragline excavation and disposal of about 970,000 cubic yards of dredge material over a two-year period. Channel maintenance would occur about every five years, and it is estimated that this would require excavation and disposal of about 20- 30,000 cubic yards of material the first five years and 10,000 cubic yards each five years thereafter. The dredged material from the lower reaches would be used to fill a 22-acre pit at the Hickory Street Landfill. Material from the upper end would be transported to an 88-acre upland site near I-65.

With inclusion of the relocation alternative, an additional 74 houses and 7 businesses would be relocated out of the 25-year floodplain. The evacuation of these structures would provide an additional 13 acres of land to the project ROW to be landscaped and planted with selected trees and shrubs where needed. A recreation plan to include such features as picnic tables, trails, and drinking fountains is also proposed for inclusion with the channel modification plan. The recreation plan would require about 5 acres of the evacuated lands for pedestrian and bicycle trails.

Fish and wildlife resources within Threemile Creek floodplain have been adversely impacted as a result of floodplain development, pollution, and stream channelization. Riparian habitat exists along the stream and a large contiguous tract of tidal forested wetlands occurs below Davis Avenue. Forested wetlands provide food and cover for many species of wildlife and provide fish spawning and feeding areas when inundated.

Wetlands also contribute detrital food material to the estuarine system and serve as natural water filtration and flood control systems. This is exemplified by those wetlands between Davis Avenue and Telegraph Road.

FWS provided a Fish and Wildlife Resource Inventory Report of May 1981 that estimated approximately 800 acres of riparian vegetation remains along Threemile Creek. Much of this is scattered remnant tracts; however, a large contiguous tidally influenced forested wetland (approximately 400 acres) is located between Davis Avenue and Telegraph Road. The general location of forested wetlands is shown on the habitat map provided in our Resource Inventory Report.

Habitat types within the project area consist of upland forest (pine and mixed pine-hardwoods), open brush, and forested wetlands. These habitats support such wildlife species as squirrels, rabbits, furbearers, quail dove, snipe, woodcock, nongame birds, waterfowl, reptiles, and amphibians. A more detailed description of the flora and fauna within the project area is provided in our Resource Inventory Report.

Channelization, development, and pollution have had a significant adverse impact on the fish population of Threemile Creek. Within project limits, only the lower tidal reach of the stream is capable of sustaining any appreciable numbers of sport or commercial fishes and these areas experience frequent fish kills. Threemile Creek is classified by the Alabama Water Improvement Commission as agricultural and industrial water supply and thus not suitable for water contact recreation, water supply for drinking, or food processing. Major sources of pollution include discharges from municipal, industrial, and stormwater runoff. The Alabama Water Improvement Commission's 1978 Water Quality Management Plan lists several recommendations needed to improve the water quality of this stream.

About 40 acres of habitat would be lost as a result of the channel modification. Much of this acreage, however, is made up of small scattered forested tracts along the stream. About six acres of tidal forested wetlands in the larger contiguous forested wetland tract below Davis Avenue would be eliminated as a result of widening.

If the acres proposed for evacuation with channel modification (22 acres) are replanted with favorable wildlife vegetative species, it could help mitigate these wetland losses. The degree of project impacts on fish and wildlife could be further reduced by the inclusion of the floodplain evacuation plan. With this plan about 13 additional acres of floodplain could be revegetated for wildlife benefits.

FWS assisted the Corps in selection of disposal areas for dredged material. Two upland sites were selected--one at the Hickory Street Landfill and the other near I-65. Some of the I-65 site consists of upland forest, but in an area zoned for development. It is our understanding these areas would provide adequate disposal for initial, as well as maintenance work.

In view of the existing poor stream water quality, very little impact is expected to occur to the limited stream fishery. Increased turbidities from channel work should only be temporary and not cause appreciable adverse impacts on tidal-area fisheries.

The Threemile Creek floodplain represents a typical example of a degraded environment without controlled development. The lack of zoning in floodplains results in significant degradation of the environment and requires high expenditures to provide flood control. FWS, therefore, fully supports the Corps of Engineers in their nonstructural floodplain evacuation plan, and would support zoning ordinances of the floodplain to control future development.

In order to reduce adverse project impacts on fish and wildlife resources we recommend that:

1. The relocation alternative be an integral part of the selected plan.

2. Where possible, the channel be widened on the side with the least habitat value.

3. Dredged material be placed in the approved 22-acre site at Hickory Street Landfill and the 88-acre site at I-65 unless other suitable upland areas are identified.

4. Areas cleared from channel work and evacuation be vegetated with plantings of value to wildlife.

We appreciate the opportunity to comment on your feasibility study and request that you keep us informed on future studies of the selected alternative plan.

Sincerely yours,

Marvin E. Moriarty
Assistant Regional Director-
Habitat Preservation

United States Department of the Interior
FISH AND WILDLIFE SERVICE
P.O. Drawer 1197
Daphne, Al 36526

January 11, 1983

Colonel Patrick J. Kelly
U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, Al 36628

Dear Colonel Kelly:

This letter is in reference to the Three Mile Creek flood control project. Our Fish and Wildlife Coordination Act report of October 21, 1982 supported the relocation alternative which was stated in the draft Environmental Impact Statement to be included with the recommended plan. This relocation called for moving an additional 74 houses and 7 businesses out of the floodplain on the lower end of the project site. It would have provided an additional 13 acres of land which would have been landscaped and planted with selected trees and shrubs.

We now understand that your agency has determined that relocating these houses and businesses out of the floodplain is not feasible and the relocation alternative as stated in our Fish and Wildlife Coordination report is no longer part of the recommended plan.

Even so, we feel the relocation is the best alternative for fish and wildlife and maintain our recommendations as presented in our Coordination Act Report.

Sincerely,

Larry E. Goldman
Field Supervisor

cc: ARD-HP, RO, Atlanta, GA
EPA, Atlanta, GA
NMFS, Panama City, FL
ADCNR, Fairhope, AL
ADCNR, Montgomery, AL
ADCNR, Dauphin Island, AL
ADEM, Mobile, AL

FINAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL ENVIRONMENTAL IMPACT STATEMENT

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FINAL

ENVIRONMENTAL IMPACT STATEMENT

Proposed Plan for Flood Control and Recreation
Threemile Creek
Mobile, Alabama

The responsible lead agency is the US Army Engineer District, Mobile.
The responsible cooperating agency is the City of Mobile.

Abstract: Threemile Creek is a small stream in the City of Mobile, Alabama. The Mobile District has investigated public concerns of the Threemile Creek area related to frequent, severe flooding. Fourteen plans were initially considered. Four, plus the no action alternative (a), were selected for detail study. Plan b, consisting of channel enlargement, would reduce flood damages and remove 42 homes and two businesses from the channel right-of-way. Plan c, consisting of channel enlargement and evacuation, would remove an additional 68 houses and 5 businesses from the flood plain. Plan d would add recreational facilities to the channel enlargement and relocations of Plan c. Plan e would combine Plan b and the recreation facilities without the evacuation of the additional houses and businesses included in Plans c and d. The no action alternative would allow severe flooding to continue. Plan e has been tentatively selected, based on its performance in addressing the identified public concerns and its net positive contributions to the goals of National Economic Development.

SEND YOUR COMMENTS TO THE DISTRICT ENGINEER BY 15 December 1982.

If you would like further information on this statement, please contact:
Mr. Jack C. Mallory
US Army Engineer District, Mobile
ATTN: SAMPD-ES
PO Box 2288
Mobile, Alabama 36628
Commercial Telephone: (205) 690-2723
FTS Telephone: 537-2723

NOTE: Information, displays, maps, etc., discussed in the Threemile Creek Main Report are incorporated by reference in the EIS.

1.0 SUMMARY

1.1 Major Conclusions and Findings. The recommended plan for flood control on Threemile Creek is the enlargement of the existing channel and the incorporation of recreational facilities. Channel enlargement would require excavation of 970,000 cubic yards of silty sand material and the construction of four drop structures involving the placement of 18,315 cubic yards of rock riprap. An additional 4,000 cubic yards would be placed in a wetland to provide an access road for construction of the channel. Recreational facilities in the form of pedestrian and bicycle paths and picnic areas would be built within the project right-of-way. Plate 9 shows the limits of the recommended plan and Chart No. 30 of Appendix C shows the recreation plan. The recommended plan is described on pages 81 through 84 of the main report. Significant long-term environmental impacts would be beneficial changes in land use from flood prone residential areas to a flood-tolerant vegetated land with recreational value. Fish and wildlife resources are of low value in the project area and therefore would not be significantly impacted.

1.2 Areas of Controversy. None have been identified at this time.

1.3 Unresolved Issues. None exist at this time.

1.4 Relationship to Environmental Protection Statutes and Other Environmental Requirements. See Table 24.

2.0 Need For and Objectives of Action. The US Army Corps of Engineers became involved in the present study in May 1980 at the request of Congressman Jack Edwards, acting in behalf of the flood victims and the City of Mobile. A history of the problem and the needs for the present study are discussed in the main report on pages 11 through 25.

2.1 Study Authority. The study authority, House Public Works Committee Resolution adopted 12 October 1972 and 11 April 1974 is discussed in detail on pages A-1-1 through A-1-2.

TABLE 24

Relationship of Plans to Environmental Requirements, Protection Statutes, and Other Environmental Requirements

Federal Statutes	Plan b	Plan c	Plan d	Plan e
Archeological and Historic Preservation Act, as amended	FC	FC	FC	FC
Clean Air Act, as amended	FC	FC	FC	FC
Clean Water Act, as amended	FC	FC	FC	FC
Coastal Zone Management Act, as amended	FC	FC	FC	FC
Endangered Species Act, as amended	FC	FC	FC	FC
Estuary Protection Act	FC	FC	FC	FC
Federal Water Project Recreation Act, as amended	FC	FC	FC	FC
Fish and Wildlife Coordination Act, as amended	FC	FC	FC	FC
Land and Water Conservation Fund Act, as amended	FC	FC	FC	FC
Marine Protection, Research and Sanctuaries Act	NA	NA	NA	NA
National Historic Preservation Act, as amended	FC	FC	FC	FC
National Environmental Policy Act, as amended	FC	FC	FC	FC
Rivers and Harbors Act	NA	NA	NA	NA
Watershed Protection and Flood Prevention Act	FC	FC	FC	FC
Wild and Scenic Rivers Act	NA	NA	NA	NA
Executive Orders, Memoranda, etc.				
Floodplain Management (EO 11988)	FC	FC	FC	FC
Protection of Wetlands (EO 11990)	FC	FC	FC	FC
Environmental Effects Abroad of Major Federal Actions (EO 12114)	NA	NA	NA	NA
Analysis of Impacts on Prime and Unique Farmlands (CEQ Memorandum, 30 Aug 76)	NA	NA	NA	NA
State and Local Policies				
None known.				
Land Use Plans				
City of Mobile	FC	FC	FC	FC
Required Federal Entitlements				
Water Quality Certification from Alabama Water Improvement Commission	FC	FC	FC	FC
Statement of Consistency from Alabama Coastal Area Board	FC	FC	FC	FC

NOTES: The compliance categories used in this table were assigned based on the following definitions:

FC: Full Compliance - All requirements of the statute, E.O., or other policy and related regulations have been met.
PC: Partial Compliance - Some requirements of the statute, E.O., or other policy and related regulations remain to be met.
NC: Noncompliance - None of the requirements of the statute, E.O., or other policy and related regulations have been met.
NA: Not Applicable - N/A statute, E.O., or other policy not applicable.

2.2 Public Concerns. The occurrence of severe floods in April and May of 1980 and a third severe flood in May 1981 caused substantial financial losses and emotional trauma to the residents of the flood plain along Threemile Creek. The affected public's major concern is protection from future flooding. A history of public involvement and public desires is discussed in Section 2 of Appendix A.

2.3 Planning Objectives. The objectives discussed on page 25 through 46 of the main report were developed in response to the needs and concerns identified above. The basic objectives for plans evaluated, in addition to achieving flood damage reduction, were directed at providing for National Economic Development (NED), and Environmental Quality (EQ). Throughout the planning process, impacts were evaluated and their contribution to Regional Development (RD) and Social Well-Being (SWB) were considered.

3.0 Alternatives.

3.1 Plans Eliminated from Further Study. A discussion of alternative plans that were considered as potential solutions is presented on page 32 of the main report. Three alternative upstream impoundments were eliminated because they did not provide sufficient reductions in downstream flood stages. Four alternative stream diversions were considered but eliminated due to public objections to the diversion channels and the public's fear of induced flooding in the communities receiving the diverted waters, and because of the loss of wetlands inherent in these alternatives. Three alternative channel enlargements were also considered. Two of these were eliminated as not being economically feasible. The third channel modification was carried forward for detail consideration. Four alternative "nonstructural" plans to remove flood prone structures from the flood plain were also considered. While these plans have some environmental attributes, they do not provide sufficient reductions in flood damages at acceptable costs. One of these alternatives was, however, carried forward for detail consideration as part of the comprehensive plan.

3.2 Plans Considered in Detail. Four alternative plans, including the "No Action" plan, were considered in detail.

a. No action.

b. Channel modification.

c. Channel modification and evacuation.

d. Channel modification, evacuation, and recreation.

e. Channel modification and recreation.

3.2.1 No action. The City of Mobile has been expanding westward in the Threemile Creek Drainage Basin for over one hundred years. Continued uncontrolled development of the Threemile Creek Drainage Basin could reasonably be expected to increase the rate of runoff and increase the flood damages. The annual damages under existing conditions as displayed in Table 9 and discussed in the section on page 25 are $1,853,100. The severe flood of May 1981 caused damages in excess of $23,000,000. In addition to these financial losses, the public is subjected to recurring trauma, health and physical danger, and great inconvenience. Although wooded areas are limited because of urban encroachment, continued development is expected to further reduce available habitat for songbirds and other wildlife. The aesthetic and recreational value of the creek and its borders would remain very low or continue to decline.

3.2.2 Channel modification. This alternative would involve increasing the channel width of Threemile Creek from 1,990 feet downstream of the Stone Street bridge to 6,270 feet upstream of Interstate 65, a distance of about 5 miles. The lower 7,799 feet of the channel would have a bottom width of 148 feet which would then be reduced to a 90-foot bottom width for the next 6,580 feet. At this point, a drop structure would raise the bottom elevation 7.6 feet and the channel would be reduced to a 75-foot bottom width. The 75-foot channel width would continue upstream for 8,070 feet to the downstream side of

Interstate 65. Another drop structure 5.6 feet high would be installed in this reach 4,010 feet below the Interstate. A 9-foot drop would be installed at the downstream end of the existing culverts under Interstate 65. Above the interstate, the channel would have a bottom width of 70 feet for 6,270 feet to the upstream end of the project at which point the modified channel would transition back into the existing channel. A drop structure 4.6 feet high would be constructed in this upper reach on the upstream side of Moffat Road. The channel slopes would be 1 vertical on 3 horizontal and would be grassed. At the transition points from one channel width to another; at the drop structures and at the confluence of the channel and two major storm drains, the slopes and bottom of the channel would be riprapped to prevent erosion. Details of the channel modification plan are shown on Chart Nos. 12 through 15 of Appendix C. Details of the drop structures are shown on Chart Nos. 16 and 17 of Appendix C. The locations of transition sections and their details are shown on Chart Nos. 13, 15, 18, and 19 of Appendix C. The storm drain intercepts are shown on Chart No. 20 of Appendix C.

Eight of the 10 bridges within the limits of the modified channel would require modification or replacement. Three of the bridges are railroads which would require modification to provide clear spans across the enlarged channel. Street bridges at Stanton Road and Mobile Streets would require extension and street bridges at Fillingim Street, St. Stephens Road, and Stone Street would require complete replacement. Bridge data is shown in Table 17.

Rights-of-way (ROW) for the modified channel would include a 20-foot-wide strip along the top of each bank and would total approximately 122 acres.

Relocations required would include sewer, water, and gas pipelines, and electric, telephone, and other communication lines. Within the ROW are 42 homes and two businesses which would be removed and relocated out of the flood plain. Structures to be removed are shown on Chart Nos. 23 and 24 of Appendix C.

Landscaping of the ROW would include grassing of the slopes and berms of the enlarged channel and the planting of grasses, shrubs, and trees to provide a

green belt along the overbank for aesthetics, wildlife habitat, and erosion control. Access for future maintenance would be along the top of the channel banks.

3.2.3 Channel modification and evacuation. This alternative would add to the channel modification plan the removal of 68 additional houses and 5 additional businesses and their relocation out of the flood plain of Threemile Creek. The evacuation of these structures would add an additional 13 acres of land to the project ROW that would be landscaped and planted with selected trees and shrubs where necessary.

3.2.4 Channel modification, evacuation, and recreation. This alternative is the comprehensive plan. It would add recreational facilities to the channel modification and evacuation. The recreation plan is described on pages 56 through 57 and would include:

12 picnic tables
1 baseball field
5 miles of bicycle trail
5 miles of pedestrian trail
1 multipurpose court
7 bicycle racks
1 waterborne toilet
4 drinking fountains
1 parking area of 889 sq. yds.

3.2.5 Channel modification and Recreation. This alternative was found to be the NED plan but was selected as the recommended plan. It would eliminate the evacuation of structures not in the modified channel ROW and reduce the land needed for the project by 13 acres.

3.2.6 Annual average benefits and costs are discussed on pages 62 through 66 in the main report and the Federal and non-Federal costs of each segment are shown in Tables 13, 14, and 15. Average annual benefits, costs, and benefit-to-cost ratios for the four construction alternatives are:

Plans (as given in 3.2)	Benefits	Costs	B/C Ratio
(a) No Action	-	-	-
(b) Channel Modification	$1,861,400	$1,278,000	1.46
(c) b+Evacuation	1,869,500	1,447,000	1.29
(d) c+Recreation	1,944,800	1,522,000	1.28
(e) b+Recreation	1,936,700	1,353,000	1.43

Alternative d provides the greatest total annual monetary benefits of these alternatives and provides flood relief for the maximum number of affected people, provides a maximum of green space within the flood plain, and provides both recreation and wildlife habitat within the green space.

However, Alternative e provides the maximum net benefits above cost and is therefore designated the National Economic Development (NED) plan. This plan provides essentially the same environmental and esthetic benefits as Alternative d, with the exception of the 13 acres of open green space which would be afforded by the removal of the additional structures from the flood plain.

4.0 Affected Environment.

4.1 Environmental conditions. Threemile Creek originates near the western corporate limit of the City of Mobile in southwestern Alabama (Figure 1). It flows eastward for about 16 miles and enters the Mobile River upstream of the Alabama State Docks. The total drainage basin of Threemile Creek is about 29 square miles and is completely within the greater Mobile urban area.

The study area is located in the Gulf Coast Physiographic Province. The terrain within the watershed varies from gently rolling in the headwaters to relatively flat in the lower reaches. Elevations range from about 220 feet above mean sea level in the headwaters to about sea level at the mouth. The creek varies in width from 10 feet in the upper reaches to 80 feet at its mouth. The fall rate is approximately 30 feet per mile in the upper 5 miles of the basin and 9 feet per mile in the lower reaches.

The major soils of the study area are classified as being of the Citronelle Formation. This formation overlies the Miocene Series and crops out in the central and southern parts of Mobile County. It consists primarily of brown, red, and orange gravelly sand that locally contains clay balls and partings, and gray, orange, and brown lenses of sandy clay. The soils along the lower reaches of Threemile Creek are alluvial deposits of the Mobile River.

For over 100 years, the City of Mobile has spread westward away from the Mobile River, covering the Threemile Creek drainage basin with housing developments, shopping centers, hospitals, schools, industrial buildings, streets, highways, and railroads. Many of these structures have encroached into the flood plain, with some buildings and paved areas encroaching right up to the stream banks. The mixed pine-hardwood forest that once covered most of the drainage basin has been largely cleared for these developments. The loss of plant cover has reduced the absorption of water from the soil, and the paving has increased the rate of runoff. Consequently, flood peaks have increased in Threemile Creek. Pipelines and bridge crossings also restrict the discharge and further aggravate flooding problems along the stream.

Water quality is fair in the upper reaches of the creek, but within the proposed project reach it is degraded by urban runoff and leaking sewage lines damaged by Hurricane Frederic in 1979 and by the severe floods of 1980 and 1981. Sanitary waste lines and storm drains are still being repaired.

Wildlife within the drainage basin consists of those species that can tolerate close proximity to human dwellings and urban activities. In the project reach, wildlife habitat is confined to narrow, disjunct wooded borders along the streambank, except for the lower end. The lower reach below the Stone Street bridge runs through a tidal swamp which supports few animals, due to bad water and air quality.

Most of the land along Threemile Creek within the project reach has been urbanized for many years, with little space available for future development. Only near Interstate 65, in the upper end of the project area, is development ongoing. Consequently, the community structure near the project is very

stable with social and economic status of the people ranging from the poverty level unemployed to upper class professionals. The environs of Threemile Creek have a long history of human occupation and numerous historical and archaeological structures and sites are within the City of Mobile. However, a preliminary reconnaissance by Corps archaeologists has located no sites within the proposed construction right-of-way (ROW) of the recommended project.

The demography, economic setting, climatology, cultural resources, and hydrology of the project area are discussed in more detail in the main report and appendices. Significant resources which could be impacted are discussed below.

4.2 Significant Resources.

4.2.1 Land use. The project area along Threemile Creek is densely developed, primarily as family housing. There are 42 houses and two businesses within the channel enlargement right-of-way of the recommended plan. Three small parks, two hospitals, and one shopping center are adjacent to the creek. The lower 2,000 feet of the proposed project extends into a tidal swamp, and some wooded and open land exists along the upper limits of the project. Undeveloped land is shown in Figure 3.

4.2.2 Community cohesion. The urban communities in the project area are very stable and have been for years.

4.2.3 Community growth. Census tract data along the project area show very little growth since most of the area is completely developed. Some new housing is being built in the upper reaches of the project and urban growth is extensive in the upper reaches of the Threemile Creek Basin westward of the project area due to westward growth of the city.

4.2.4 Housing. The majority of the houses in the project area are single family dwellings which range from poverty level, substandard wooden structures to houses valued at over $100,000. Generally, the older houses are in the

lower reaches and the newest are in the very upper reach of the project area. However, some expensive homes are located in the lower half of the project.

4.2.5 Employment. Employment in the project area reflects the general employment situation of the greater Mobile area. Due to the presence of four hospitals, there are a number of medical offices near the project area which employ medically oriented personnel. Some industrial development primarily devoted to warehousing provides employment near the western end of the project near Interstate 65. Employment is discussed on page 9 in the main report.

4.2.6 Displacement of people, businesses, and farms. Land use has been stable for years in the project area and new construction in recent years has been on undeveloped land in the western end of the project area. No farm land exists in the project area.

4.2.7 Public facilities. Facilities are typical of an older urban area devoted primarily to single family dwellings; however, no schools, hospitals, fire stations, or similar facilities are located in the project ROW.

4.2.8 Public services. Services are adequate and typical of an urban area in a large city. Public utilities include electricity, water, gas, sewage disposal, garbage pick up, and police and fire protection.

4.2.9 Transportation. The project area is served by a network of city streets and one interstate highway. Three railroads, 11 street bridges, and one interstate bridge cross the creek in the project area. Transportation facilities crossing the creek area are shown in Table C-8 of Appendix C.

4.2.10 Property values. The area has been highly developed and stable for many years, so property values have changed only as a reflection of the general economy. However, recent flood events damaging 1,107 homes and 85 commercial structures have adversely affected property values in the Threemile Creek flood plain. Property values in the flood plain are shown in Appendix B.

4.2.11 Tax values. Tax values have reflected the general economic conditions of the Mobile area. The project is not expected to significantly affect the local tax structure.

4.2.12 Noise. Noise levels are typical of a heavily developed residential area. There is no heavy industry or other point sources of high noise levels. Train traffic across the three railroad bridges is slow moving and occasional. The highest noise levels are the result of commercial airplane traffic approaching or leaving the two air fields that service Mobile.

4.2.13 Leisure opportunities. Recreation in the vicinity of the proposed project is almost completely urban but the city has an unusually high number of parks. In the vicinity of the proposed project are nine parks, three of which border the creek. These parks combined provide: picnic tables, ball fields, basketball and tennis courts, swimming pools, play equipment, and recreation buildings. Trails for pedestrian or bicycle use are nonexistent so that joggers use sidewalks and streets. Existing recreation facilities are discussed on page 56 in the main report. In years past, Threemile Creek was used for fishing and swimming, but urban development has degraded the water quality and aesthetics below Interstate 65 to the point where little recreational use is made of the stream.

4.2.14 Aesthetics. The upper reaches of Threemile Creek still have sufficient riparian forest cover to be aesthetically pleasing. However, downstream from Interstate Highway 65 severe encroachment has reduced it to an urban ditch of low aesthetic quality.

4.2.15 Riparian environment. The right-of-way (ROW) for the proposed project would require 122 acres of which only 40.5 acres are vegetated. Forested areas are confined mostly to the immediate streambanks except in the lower and upper extremes of the project (Figure 3). Red maple (Acer rubrun), river birch (Betula nigra), black-willow (Salix nigra), sweetgum (Liquidambar styraciflua), slash pine (Pinus elliottii), and wax myrtle (Myrica cerifera) are among the more common woody plants within the ROW of the proposed channel. Below the Davis Avenue-Stone Street Bridge, however, the riparian forest is

57-331 O - 86 - 7

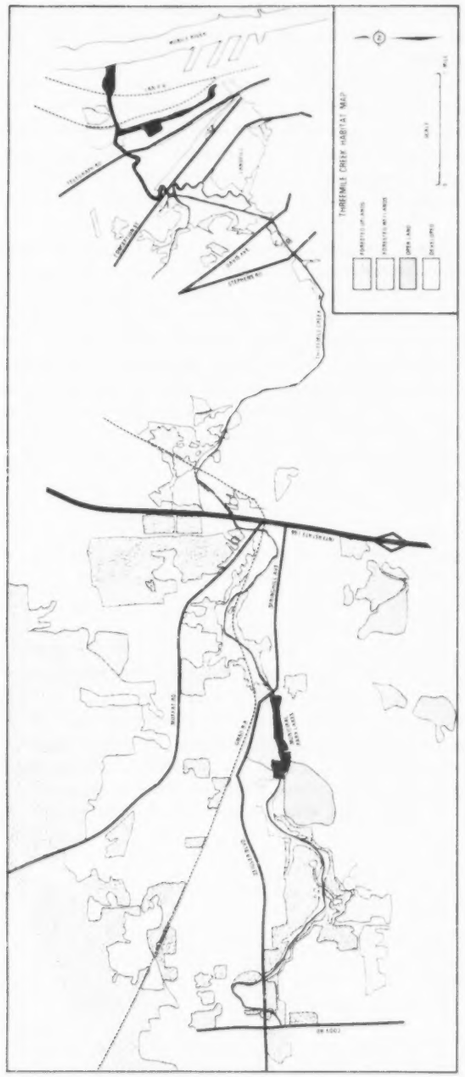


Figure 3

composed of swamp species with tupelo (Nyssa sylvatica) and sweet bay (Magnolia virginiana) being abundant. This swamp would be high quality, wetland habitat if water and air quality were not so poor.

4.2.16 Fish and wildlife. Wildlife along most of the project reach consists of those animals adapted to urban conditions, such as the gray squirrel (Sciurus carolinensis), the opossum (Didelphis virginiana), and songbirds. Approximately 100 species of birds utilize the project area during spring and fall migrations. Fishes in the stream within the project reach are very limited in diversity and abundance due to poor water quality.

4.2.17 Endangered and threatened species. The proposed construction area is too heavily developed to provide habitat suitable for species listed by the Department of the Interior as endangered or threatened. The American alligator (Alligator mississippiensis) and the brown pelican (Pelecanus occidentalis), listed as endangered species, are occasional visitors. These species are not, however, residents within the project area.

4.2.18 Air quality. Mobile County was designated a nonattainment area in 1981 by the Alabama Air Pollution Control Commission because of repeated violations of both primary and secondary ambient air quality standards, especially for ozone, sulfur oxides, and total suspended particulates. The monitoring station at the Alabama State Docks, near the mouth of Threemile Creek, has recorded the most violations of primary ambient air quality standards of any station in the county. Industrial discharges from plants along the Mobile River are a major source of air pollution. Consequently, air quality is better in the western end of the project than it is in the lower reach.

4.2.19 Water quality. Threemile Creek is classified by the Alabama Water Improvement Commission (AWIC) for agricultural and industrial water supply and is not suitable for fishing, water contact recreation, or as a water supply for drinking or food processing.

The creek has a long history of poor water quality due mainly to the cumulative effects of stormwater runoff, point source discharges, hydrologic modifications of the drainage basin, and untreated sewage inflow from numerous and frequent broken sewer lines. Water quality monitoring on Threemile Creek by the AWIC and water testing by others indicate that State water quality standards are frequently violated, especially for dissolved oxygen and fecal coliform bacteria.

Two municipal treatment plants are located on Threemile Creek--the Grover Street Sewage Treatment Plant (STP) and the Threemile Creek STP. According to the 1978 Water Quality Management Plan (WQMP) for Mobile and Baldwin Counties, both treatment plants "show biological efficiency losses and significant infiltration/inflows. These two problems are likely interrelated since both show adequate hydraulic design capacity during dry weather flow." As mentioned above, the discharges from the two treatment plants contribute to the water quality problems of Threemile Creek, particularly during dry weather. Table 25 provides an inventory of all municipal and industrial point sources and their discharge location into Threemile Creek.

TABLE 25

Inventory of Point Sources and Discharges
into Threemile Creek
(Source: Alabama Water Improvement Commission, 1982)

SOURCE	PROCESS/DISCHARGE
Crown Zellerbach	Pole and piling preservation
Grover Street STP	Sewage treatment
Gulf Lumber Company	Cooling water only
St. Louis and San Francisco RR	Locomotive and car washing
Illinois Central Gulf RR	Locomotive and car washing
Mobile Rosin Oil	Stormwater containing fuel and cooling water
Star Fish and Oyster	Seafood processing wastewater
Stone Container Corp.*	Paper board manufacturing wastewater
Threemile Creek STP	Sewage Treatment

* Only listed point source in the project reach. Other listed sources enter Threemile Creek downstream of the project reach.

The WQMP also points out that "desired water quality goals (for Threemile Creek) cannot be met solely by controlling discharges from municipal and industrial sources. During wet weather, significant amounts of pollution enter streams in the Mobile urban area through stormwater runoff. Waste loads from the critical storm . . . . are much larger than point source loads on Threemile Creek . . . ." The WQMP concludes that "Threemile Creek is severely impacted by urban stormwater. In order to achieve the water quality objectives for Threemile Creek, it has been determined that waste loads resulting from stormwater will need to be reduced by about 40 percent. An evaluation of the application of best management practices for the drainage basin indicates that a combination of practices cannot achieve this overall reduction and structural controls may be necessary."

Some of the recommendations included in the WQMP to improve the water quality of Threemile Creek are as follows:

a. Relocate the discharge site for the Threemile Creek STP and the Grover Street STP from Threemile Creek to a common outfall in Mobile River.

b. All industries discharging into Threemile Creek be required to meet best available treatment (BAT) levels by 1983 or connect their discharges to a sanitary sewer system.

c. Increased street sweeping, trash collection, and catch basin cleaning be implemented in the Threemile Creek drainage basin as soon as possible.

d. Erosion control ordinances and subdivision regulations sensitive to water quality issues be adopted and enforced by local government.

e. Septic systems should not be permitted in flood prone areas of Threemile Creek.

f. Local planning commissions should review proposed development plans to assure that no harmful water quality impacts will result from intended or unintended hydrologic modifications.

4.2.20 Erosion. Through most of the proposed project reach, the fall rate is low and the flood plain is developed so erosion has not been excessive except in a few limited locations. However, in the upper end of the project above I-65 and upstream of the proposed project to the headwaters of the creek, erosion is a problem due to steep topography and sandy soil. In recent years, bank erosion along the stream has been increased by clear cutting the riparian forest in order to increase the hydraulic efficiency of the creek. Consequently, the creek bed throughout the proposed project reach is now unconsolidated sand which flows downstream during high discharges. During recent floods, sand was washed out into housing developments along the creek.

4.2.21 Benthic community. The substrate of Threemile Creek within the project area is predominately unconsolidated sand which flows during periods of high stream flow. The unstable, sandy substrate, and poor water quality prevent the development of a significant benthic community within the project reach.

4.3 Resources of Principal National Recognition. Resources of national recognition are shown in Table 26.

5.0 ENVIRONMENTAL EFFECTS.

5.1 No Action. This alternative would allow flood damages to continue with each flood-producing storm. If development of the drainage basin continues, runoff would increase (Table 5) and wooded areas and open land along the creek would be lost further reducing the limited wildlife habitat.

5.2 Channel Enlargement. Approximately 46.5 acres of additional undeveloped land would be committed to construction. This undeveloped land consists of approximately 5.2 acres of swamp, 34 acres of bottomland forest, 3.6 acres of upland forest, and 3 acres of open land. Due to the highly developed, urban

TABLE 26

Effects of the Recommended Plan on Resources of Principal National Recognition

Types of Resources	Principal Sources of National Recognition	Measurement of Effects
Air Quality	Clean Air Act, as amended (42 U.S.C. 1857h-7 et seq.)	Slight decline during construction due to exhaust emissions and fugitive dust. Slight long-term improvement due to increased vegetation.
Area of particular concern within the coastal zone	Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1451 et seq.)	5.2 acres of tidal, fresh water swamp would be lost.
Endangered and threatened species critical habitat	Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)	No significant effect.
Fish and wildlife habitat	Fish and Wildlife Coordination Act (16 U.S.C. Sec. 661 et seq.)	5.2 acres of swamp, 39.7 acres of bottomland forest, 3.6 acres of upland forest, and 3 acres of grassland would be disturbed during construction. Approximately 22 acres of developed area would be converted to vegetated land. Approximately 8 acres would be paved for recreation within the 122-acre project lands.
Flood plains	Executive Order 11988, Flood Plain Management	Approximately 22 acres of developed land would be returned to vegetated flood plain.
Historic and cultural properties	National Historic Preservation Act of 1966, as amended (16 U.S.C. Sec. 470 et seq.)	None known in the planning area but sites may be uncovered during construction.
Prime and unique farmland	CEQ Memorandum of August 1, 1980: Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act	None present in the planning area.

TABLE 26 (Cont'd)

Effects of the Recommended Plan on Resources of Principal National Recognition

Types of Resources	Principal Sources of National Recognition	Measurement of Effects
Water Quality	Clean Water Act of 1977 (33 U.S.C. 1251 et seq.)	No effect.
Wetlands	Executive Order 11990, Protection of Wetlands Clean Water Act of 1977 (42 U.S.C. 1857h-7, et seq.)	Approximately 5.2 acres of tidal freshwater swamp would be altered to open water.
Wild and scenic rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271 et seq.)	Not present in planning area.

nature of the surrounding environs, this loss would only affect wildlife adapted to urban environments and migratory songbirds. The existing fishery and benthic communities are very low in numbers and diversity due to poor water quality and unstable substrates. The new channel would stabilize the substrate and new habitat would be provided by the riprap at the grade control structures. Turbulence at each grade control structure and the increased surface to volume ratio of the widened channel would increase aeration of the water. However, the increased insulation combined with slowed water velocities may cancel any gain in water quality.

Enlarging the channel would involve the excavation and disposal of approximately 970,000 cubic yards of material which would consist primarily of silty sand. Maintenance of the project would occur about every 5 years and require the excavation and disposal of an estimated 20,000-30,000 cubic yards of material at the end of the first 5 years and 10,000 cubic yards at 5-year intervals thereafter. The reduction in sediment transport would result from reduced water velocities caused by the drop structures and the larger channel and reduced bank erosion caused by the grassing, landscaping, and riprap.

Material from the lower reaches of the project would be used to fill a 22-acre borrow pit at the Hickory Street Dump, an inactive sanitary landfill owned by the City of Mobile. Material from the upper reaches would be hauled to an 88-acre upland site near Interstate Highway 65. This site is now partially forested, but is zoned for development.

During construction, for a period of about 2 years, the movement of an estimated 62,500 truckloads of material to the disposal sites along urban streets would raise noise levels slightly and slightly degrade air quality. An additional potential problem that would require careful control would be fugitive dust from the haul trucks. The excavation and construction activities would add to noise, air quality, and dust problems. However, these problems should not be severe and would be ameliorated by the movement of the construction locations and the continuous change in haul routes as construction progresses along the five-mile project reach.

Some temporary trauma would be expected in the removal of 42 houses and two businesses, but the people involved would benefit by being relocated out of a flood area. Most of these families are expected to relocate within their present community, so no significant effects would be experienced by public facilities or services.

The approximately 5.2 acres of tupelo swamp that would be cleared and excavated for channel widening or filled for a maintenance access road comprise the most valuable wildlife habitat affected by the project. This wetland is, however, flooded by high tides with heavily polluted fresh water and subjected to fallout from industrial activities along the Mobile River to such an extent that wildlife use of the swamp is limited.

No endangered or threatened species listed by the Department of the Interior would be affected by the proposed work on Threemile Creek. The American alligator (Alligator mississippiensis), an endangered species occurs in abundance in the swamps and marshes of the Mobile area. However, surveys by US Fish and Wildlife and Corps biologists have detected no alligators in the proposed project reach. The low number of alligators in the Threemile Creek tidal swamp is indicative of the poor water quality and consequent poor aquatic biota. The brown pelican (Pelecanus occidentalis), also an endangered species, is an abundant summer resident along the coast of Alabama; however, it is a rare visitor to Threemile Creek.

Preliminary reconnaissance by Corps archaeologists have discovered no archaeological or historical sites within the 122 acres of channel ROW; however, it is probable sites would be discovered during construction. Appropriate measures would be taken to preserve or mitigate any significant cultural resources discovered.

Long-term impacts on air, noise, and water pollution would be insignificant. Man-made and natural resources, aesthetic values, community cohesion, and public services and facilities would all benefit by the reduction in flood magnitudes and frequencies.

The short-term effects on employment and tax and property values inherent in evacuating 42 houses and two businesses would be replaced by long-term benefits, resulting from their relocation to areas less subject to flood damage. The relocations are expected to be within the existing communities, so values would be enhanced by reduced flood losses.

Desirable community and regional growth would be enhanced since the communities subject to flooding and the City of Mobile would reduce the cost of repairs and cleanup required after damaging floods.

5.3 Channel Enlargement and Evacuation. In addition to the impacts discussed above, this combined plan would further reduce flood damages and remove an additional 68 houses and 5 businesses out of the high flood risk zone. Social impacts on the individuals involved and their communities would not be significantly different from those families and businesses which would be evacuated in the previously discussed channel enlargement alternative.

An environmental benefit would be the addition of 13 acres of green space within the project, but outside of the channel ROW. The additional space would slightly reduce noise levels in the adjacent community. Landscaping of the additional 13 acres and the planting of selected trees and shrubs would provide additional habitat for urban wildlife and birds and improve the aesthetic appearance of the project for most beholders.

5.4 Channel Enlargement, Relocation, and Recreation. In addition to the impacts discussed above, the inclusion of recreational facilities would involve a loss of approximately 5 acres of vegetated area within the project ROW for the proposed pedestrian and bicycle trails. Due to the popularity of jogging and cycling in the project vicinity and the scarcity of trails away from automobile traffic, the proposed trails should be heavily used. This use should certainly enhance the project benefits in terms of human use and safety. Additional landscaping for recreational use would mitigate the slight loss of vegetated area for wildlife which would result from construction of the recreation facilities.

5.5 Channel Enlargement and Recreation. This alternative would have essentially the same impacts discussed above in paragraphs 5.2 and 5.4, except that the environmental benefits of the additional 13 acres of green space and flood relief for five businesses and the occupants of 68 houses would not be realized. Table 26 summarizes the effects of this plan, the Recommended Plan, on area resources of National recognition as specified by legislature.

6.0 Public Involvement.

6.1 Public Involvement Program. A history of public involvement is discussed in Section II of Appendix A.

6.2 Coordination With Other Agencies. The proposed project area along Three-mile Creek has been visited by personnel from the US Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, Alabama Department of Conservation and Natural Resources, and the City of Mobile. Their formal and informal suggestions and recommendations have been incorporated into the planning process. Investigations of historical and archeological resources are being coordinated with the Alabama State Historic Preservation Officer. Endangered and threatened species are being coordinated with the US Fish and Wildlife Service.

6.3 Statement Recipients. The following agencies and organizations received copies of the Draft Interim Survey Report and Draft Environmental Impact Statement for review and comment.

A complete list of recipients, including individuals, is included in Section III of Appendix A.

Environmental Protection Agency
Food and Drug Administration
US Public Health Service
Soil Conservation Service
Federal Energy Administration
Heritage Conservation and Recreational Services
Alabama State Clearinghouse
Alabama Department of Conservation and Natural Resources
Alabama Attorney General
Federal Power Commission
Center for Disease Control
US Fish and Wildlife Service
Bureau of Land Management

American Rivers Conservation Council
Alabama Water Improvement Commission
Federal Energy Regulatory Commission
Department of Housing and Urban Development
Federal Emergency Management Agency
US Geological Survey
Federal Highway Administration
Federal Railroad Administration
US Coast Guard
US Department of the Interior
US Department of Commerce
National Marine Fisheries Service
US Department of Transportation
Federal Aviation Administration
Alabama Conservancy
Sierra Club
Birmingham Audubon Society
National Audubon Society
National Wildlife Federation
The Institute of Ecology
League of Women Voters
Wildlife Management Institute
Tri Rivers Waterway Development Association
Pearl River County Development Association, Inc.
Baldwin County Wildlife and Conservation Association

6.4 Responses to Comments. The following pages present the comments received from the reviewing agencies and the Corps responses to these comments.

READEX FICHE

US Department of Transportation
Federal Aviation Administration

Southern Region

P. O. Box 20636
Atlanta, Georgia 30320

JUN 17 1982

Mr. Lawrence R. Green, Chief, Planning Division
Department of the Army
Mobile District Corp of Engineers
P.O. Box 2288
Mobile, Alabama 36628

Dear Mr. Green:

Coordination and Review of Draft Report and
Environmental Statement on 3-Mile Creek,
Mobile, Alabama

This will acknowledge your letter of June 1, 1982, advising that the Corp of Engineers proposes a flood control plan for 3-Mile Creek.

We have reviewed the project with respect to potential environmental impact for which this agency has expertise. Our review indicates there will be no significant adverse effects to the existing or planned air transportation system as a result of this project.

Thank you for the opportunity to review and comment on this proposal.

Sincerely,

B.H. Harris

for Thomas J. Hoffman
Acting Chief, Aviation Policy and
International Affairs Staff

Response to U.S. Department of Transportation

Your review and comments are appreciated.

SOUTH ALABAMA
REGIONAL PLANNING COMMISSION

INTERNATIONAL TRADE CENTER
250 N. WATER STREET

(205) 433-6541 RICHARD D. PRUITT
EXECUTIVE DIRECTOR

MAILING ADDRESS
P. O. BOX 1665
MOBILE, ALABAMA 36633

NORMAN J. WALTON, CHAIRMAN
NEIL LAUDER, GENERAL VICE-CHAIRMAN
J. C. DAVIS, JR., PROJECT REVIEW VICE-CHAIRMAN
W. M. MCGOUGH, SECRETARY
DEVON WIGGINS, TREASURER

June 24, 1982

Mr. Lawrence R. Green, Chief, Planning Div.
Department of the Army
Mobile District, Corps of Engineers
P. O. Box 2288
Mobile, Alabama 36628

Re: Interim Survey Report and EIS
for Threemile Creek, Mobile Co.

Dear Mr. Green:

The South Alabama Regional Planning Commission has considered your recent request for review of the above referenced project.

Enclosed is a copy of the resolution adopted by the Commission which shows our recommendations as an areawide review agency for projects reviewed under the provisions of the United States Office of Management and Budget Circular A-95, revised.

If you have questions, or if we can be of further assistance, please call the Commission office.

Sincerely,

Bonnie Ammons

Bonnie Ammons
Regional Planner

js

Encl.

cc: Donna Snowden, State Clearinghouse
SARPC File No. 82-52-1

SOUTH ALABAMA
REGIONAL PLANNING COMMISSION
RESOLUTION

U. S. Army Corps of Engineers
Mobile District
Interim Report and EIS for Threemile Creek

WHEREAS, the Mobile District Army Corps of Engineers has prepared an Interim Survey Report and Environmental Impact Statement for flood control along Threemile Creek; and,

WHEREAS, the South Alabama Regional Planning Commission in its capacity as the areawide review agency is required to review and comment on grant applications under the provisions of the U. S. Office of Management and Budget Circular A-95, revised; and,

WHEREAS, pursuant to the referenced review, the Commission finds that the report and draft environmental impact statement is consistent with the Mobile Area 208 Water Quality Management Plan; now,

THEREFORE, Be It Resolved by the South Alabama Regional Planning Commission in session this 23rd day of June, 1982, that the same does hereby concur with the referenced plan.

SOUTH ALABAMA REGIONAL PLANNING COMMISSION — MOBILE, ESCAMBIA, BALDWIN

By: J. C. Davis Jr.
Vice-Chairman for Project Review

By: D. A. Pruitt
Secretary

Response to South Alabama Regional Planning Commission

Your review and comments are appreciated.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA GEORGIA 30365

4PM-EA/SN

JUN 20 1982

Mr. Lawrence R. Green
Chief, Planning Division
Corps of Engineers, Mobile District
P. O. Box 2288
Mobile, Alabama 36628

Dear Mr. Green:

We have reviewed the draft environmental impact statement on Three Mile Creek (Mobile County) and found both the document and the overall design of the selected alternative acceptable. As a rule, this Agency has significant reservations about flood control projects involving extensive channelization. However, given the urban nature of the watershed, differences in relief between the upper and lower reaches of the creek, and the creek's outlet into the tidally influenced waters of Mobile Bay, major excavation was necessary to provide sufficient capacity for flood waters. Unfortunately, there will be some important losses of valuable bottomland hardwood/wetland habitat attendant to this construction. In this particular case the document develops a sufficiently compelling economic and societal rationale for us to believe these losses are in the overall public interest. Nevertheless, to the extent possible we urge that the final design of the channel incorporate the mitigation measures mentioned in the U. S. Fish & Wildlife coordination report. Additionally, the evacuated areas below Davis Avenue as well as appropriate sites throughout the easement right of way should be planted with the species lost through construction activities.

During the initial coordination visits/site inspections attended by members of my staff, it is pointed out that structural modifications would be necessary to mitigate the effects of years of improvident land use decisions by the local communities. Considering the constraints imposed by this absence of previous planning, it was our evaluation that the selected design was a reasonable trade off between the project's objectives and environmental amenities. This is often very difficult since these two entities tend to be mutually exclusive. Since we understand there are similar problems throughout the Mobile area, we look forward to working with you and your staff toward their successful resolution.

On the basis of our review a rating of LO-1 was assigned, that is, we do not anticipate any significant/long-term adverse environmental consequences accruing from this facility and no additional information is requested.

If we can be of further assistance, feel free to call on us.

Sincerely yours,

Sheppard N. Moore

Sheppard N. Moore
Chief, Environmental Review Section
Environmental Assessment Branch

Response to United States Environmental Protection Agency

We have incorporated into the design of the channel all of the mitigation measures recommended by the Fish and Wildlife Service with the exception that the channel be widened on the side of the least habitat value. However, we plan to give further consideration to this recommendation of the Service during Continued Planning and Engineering studies and make appropriate modifications in the channel design in those instances when the integrity of the channel in performing its hydraulic functions is not threatened.

United States Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, AL
36830

July 15, 1982

U. S. Army Corps of Engineers District
Mobile, ATTN: PD-C
P. O. Box 2288
Mobile, Alabama 36628

Gentlemen:

The draft environmental impact statement for Threemile Creek, Mobile, Alabama, was referred to the Soil Conservation Service on June 7, 1982, for review and comment. We offer the following comment for your consideration.

The EIS should contain a section on Soils. This section should address the different soil types, acreages within the project area, and frequency and duration of flooding for each soil.

Frequently, projects which have drainage or channeling proposals will result in the creation of prime farmland. Where this is true the acreages created should be listed.

We appreciate the opportunity to review and comment on the proposed project.

Sincerely,

Ernest W. Todd
State Conservationist

Response to U.S. Soil Conservation Service

Soil types in the project area are discussed in a general nature in the EIS in Section 4.1. However, the areal extent of the different soil types and the duration and frequency of flooding for each soil is not readily available and has not been included in the discussion.

Since the lands involved in the project are located completely within a major city, no farmland would be created or affected.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

July 16, 1982

U.S. Army Corps of Engineers
Department of the Army
Mobile District
P.O. Box 2288
Mobile, Alabama

Dear Sir:

This is in reference to your draft environmental impact statement entitled "Threemile Creek in Mobile, Alabama." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving two copies of the final environmental impact statement.

Sincerely,

Joyce Wood

Joyce M. Wood
Director
Office of Ecology and Conservation

Enclosure:

Memo from: Robert R. Rollins
National Ocean Survey

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
Rockville, Md 20852

June 23, 1982

TO: PP/EC - Joyce M. Wood

FROM: OA/C5 - Robert B. Rollins

SUBJECT: DEIS 8206.21 - Threemile Creek -- Mobile, Alabama

The subject statement has been reviewed within the areas of the National Ocean Survey's (NOS) responsibility and expertise, and in terms of the impact of the proposed action on NOS activities and projects.

Geodetic control survey monuments may be located in the proposed project area. If there is any planned activity which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activity in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation required for NOS monuments. For further information about these monuments, please contact Mr. John Spencer, Director, National Geodetic Information Center (OA/C18) or Mr. Charles Novak, Chief, Network Maintenance Branch (OA/C172), at 6001 Executive Boulevard, Rockville, MD 20852.

Response to U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Ecology and Conservation

No geodetic control survey monuments are known to exist within the project rights-of-way. However, if any are discovered during advanced design or construction, the National Geodetic Information Center will be contacted and arrangements will be made to relocate the monuments.

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
Atlanta, Georgia 30333
(404) 262-6649

July 16, 1982

U.S. Army Corps of Engineers
Mobile District
Attn: PD-C
P.O. Box 2288
Mobile, Alabama 36628

Gentlemen:

We have reviewed the Draft Report and Environmental Impact Statement (EIS) for Threemile Creek in Mobile, Alabama. We are responding on behalf of the Public Health Service.

The EIS does not address the effects of the project on mosquito or other vector populations. The Final EIS should address vector populations and anticipated control measures that will be employed, including shoreline preparation, kinds and volumes of pesticides that may be used, and anticipated application procedures.

The Final EIS should describe any vegetation controls that may be employed along shoreline areas, including methods of chemical application, types of herbicides, application rates, and other related aspects of the control program.

Since the project involves relocating the residents of 42 houses and 2 businesses within the channel enlargement right-of-way, as well as an additional 74 houses and 7 businesses within the limits of the recommended plan, the Final EIS should describe the planned relocation program.

Thank you for the opportunity to review this EIS. Please send us a copy of the Final EIS when it becomes available. If you should have any questions about our comments, please contact Mr. Lee Tate of my staff at FTS 236-6649.

Sincerely yours,

Frank S. Lisella, Ph.D.
Chief, Environmental Affairs Group
Environmental Health Services Division
Center for Environmental Health

Response to Department of Health and Human Services

Throughout the project reach, Threemile Creek is a steep-sided channel that does not provide breeding conditions for mosquitoes. The modified channel would not provide breeding habitat because the waters would continue to flow between confined slopes. The project may somewhat reduce mosquito breeding by reducing flooding and the creation of temporary standing waters outside of the channel. The Mobile County Health Department operates a vector control program which includes the project area.

No vegetation controls except for mowing would be employed within the project rights-of-way.

The Final EIS has been modified to reflect that relocation, or evacuation, was an alternative that was considered for the study, but has been eliminated as a component of the final recommended plan.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303-3376

AUG 20 1982

ER-82/1230

Colonel Robert H. Ryan
Commander and District Engineer
U.S. Army Engineer District,
Mobile
Post Office Box 2288
Mobile, Alabama 36628

Dear Colonel Ryan:

The Fish and Wildlife Service (FWS) has reviewed the Draft Interim Survey Report and Draft Environmental Impact Statement (DEIS) on Threemile Creek, Mobile, Alabama. The Survey Report and DEIS adequately address fish and wildlife resources, environmental impacts, and mitigation measures.

The FWS supports the nonstructural floodplain evacuation plan which could provide about 13 acres of riparian habitat. As stated in the DEIS, we concur in the planting of these evacuated areas with vegetation suitable to wildlife.

The FWS will specifically address these and other mitigation measures in our forthcoming Fish and Wildlife Coordination Act Report.

Sincerely yours,

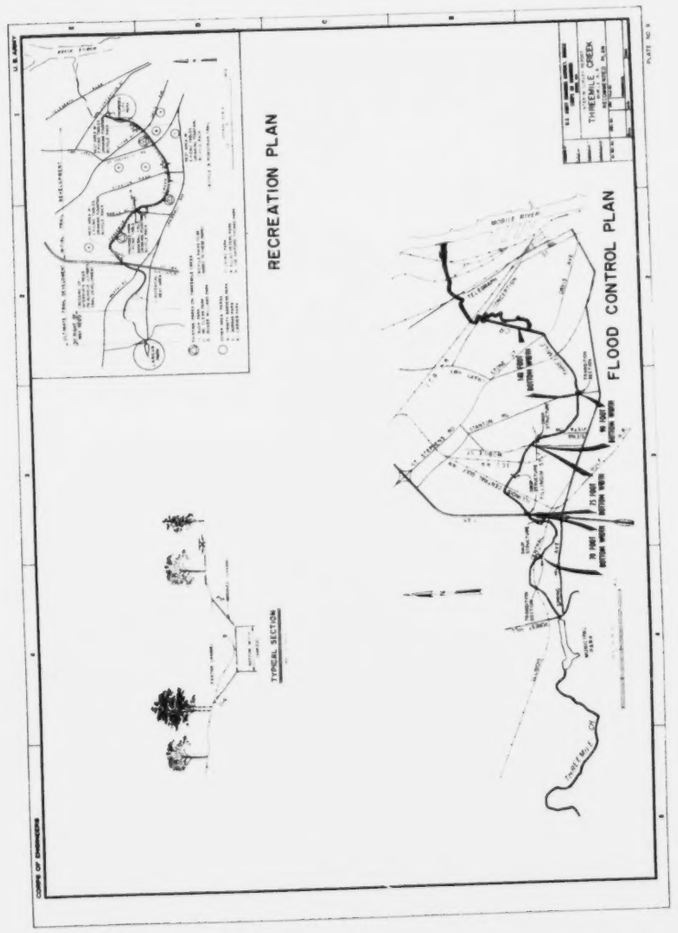
James W. Williams
Regional Director

Response to United States Department of the Interior

Your finding that the Survey Report and Environmental Impact Statement adequately addresses fish and wildlife impacts and mitigation measures associated with the proposed project is noted. Your support for flood plain evacuation is also acknowledged; however, the evacuation component has not been included in the recommended since it was not economically justified on an incremental basis. Your Fish and Wildlife Coordination Act Report and our responses to the recommendations contained therein are included in Appendix A to the main report.

7.0 List of Preparers.

Name	Discipline/ Expertise	Experience	Role In Preparing EIS
Richard A. Hill	Economics	7 yrs, Economic Evaluation of Water Resource Projects, 4 yrs in Mobile District, 3 yrs in Tulsa District	Socioeconomic Effects
Thomas A. Lightcap	Engineering/ Environmental	9 yrs, EIS Studies, Mobile District	Air and Water Quality
Jack C. Mallory	Biology/ Ecology	11 yrs, EIS Studies, Mobile District; 3 yrs, Fishery Biologist, US Fish & Wildlife Service; 5 yrs, Marine Biologist, State of Alabama; 1 yr, Mosquito Control, Mobile County, AL	Environmental Impacts, EIS Coordinator
Timothy R. Phillips	Engineering/ Hydraulics	2 yrs, Hydraulic Design, Mobile District	Alternative Evaluations
John W. Woolsey	Engineering/ Water Resource Planning	20 yrs, Water Resource Studies Mobile District	Study Manager
Ernest W. Seckinger, Jr.	Archeology/ Cultural Resources	8 yrs, Archeology, 4 yrs in Mobile District	Cultural Resource Survey



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